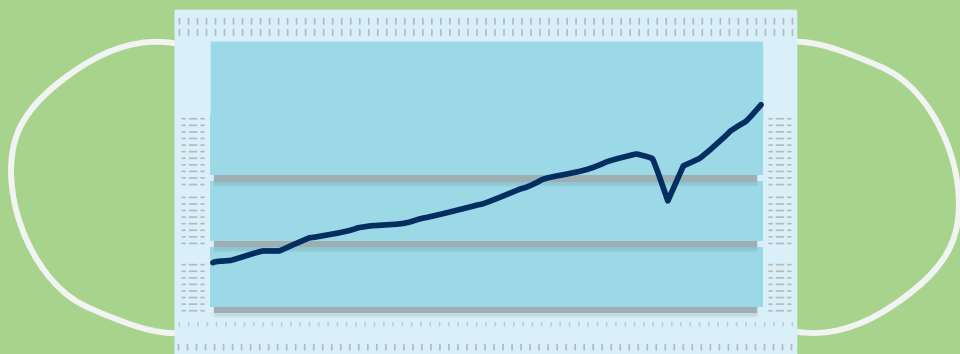


RECESSION REMEDIES

Lessons Learned from the
U.S. Economic Policy Response to
COVID-19



Edited by
**Wendy Edelberg, Louise Sheiner,
and David Wessel**

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Hutchins Center
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The policy proposals included in this volume are proposals from the authors. As emphasized in The Hamilton Project's original strategy paper, the Project was designed in part to provide a forum for leading thinkers across the nation to put forward innovative and potentially important economic policy ideas that share the Project's broad goals of promoting economic growth, broad-based participation in growth, and economic security. The authors are invited to express their own ideas in policy papers, whether or not the Project's staff or advisory council agrees with the specific proposals. These policy papers are offered in that spirit.

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Overview

Wendy Edelberg, Louise Sheiner, and David Wessel

Introduction

The worst global pandemic in a century took a devastating human toll, threatening lives and livelihoods nearly everywhere. More than six million people around the world had died from COVID-19 as of April 2022, nearly 1 million of them in the U.S. (Johns Hopkins 2022a). Figure 1 shows the course of the pandemic through the number of deaths associated with COVID-19 in the U.S.

COVID-19 hit certain racial and ethnic groups particularly hard. As Figure 2 illustrates, adjusted for age and compared to the rate for white, non-Hispanic people, the death rate associated with COVID-19 among American Indian/Alaska Native people was about 2.5 times higher, and the rate among Black people was almost twice as high, while the rate among Hispanic people was slightly higher.

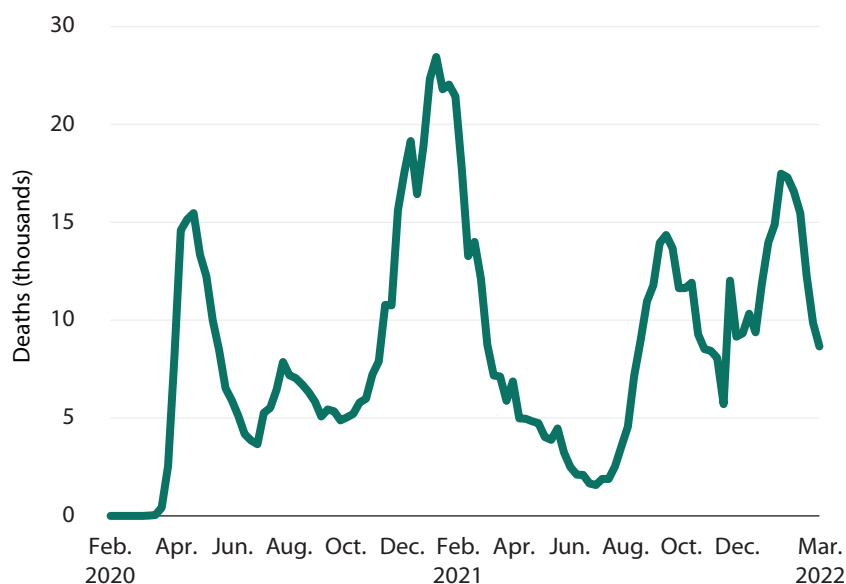
Vaccine development exceeded expectations in both timing and efficacy (Boyle 2021; Klein and Tufekci 2022). Vaccines were made available for high-risk groups in December 2020, just 11 months after the first COVID-19 case was detected in the United States. As constraints on vaccine eligibility loosened, average daily vaccinations peaked in April 2021 (New York Times 2022). In January 2022 fully vaccinated people were 2.4 times less likely to test positive for COVID-19 and 9 times less likely to die from it (Centers for Disease Control and Prevention [CDC] 2022b). As of early April 2022, about three-quarters of Americans had received at least one dose of the COVID-19 vaccine, two-thirds had received two doses, and nearly half had received a booster (New York Times 2022).

COVID-19 and the Economy

The pandemic posed an extraordinary threat to the economy. President Trump declared a nationwide public health emergency in March 2020. Around that time, many states and localities began to order lockdowns—closing schools, shutting bars and restaurants, and suspending public gatherings. Many people dramatically reduced their face-to-face interactions, and businesses closed or told employees to work from home.

FIGURE 1

Weekly Deaths from COVID-19 in the U.S.



Source: Johns Hopkins 2022b.

Note: Weekly deaths are plotted through the week ending March 20, 2022.

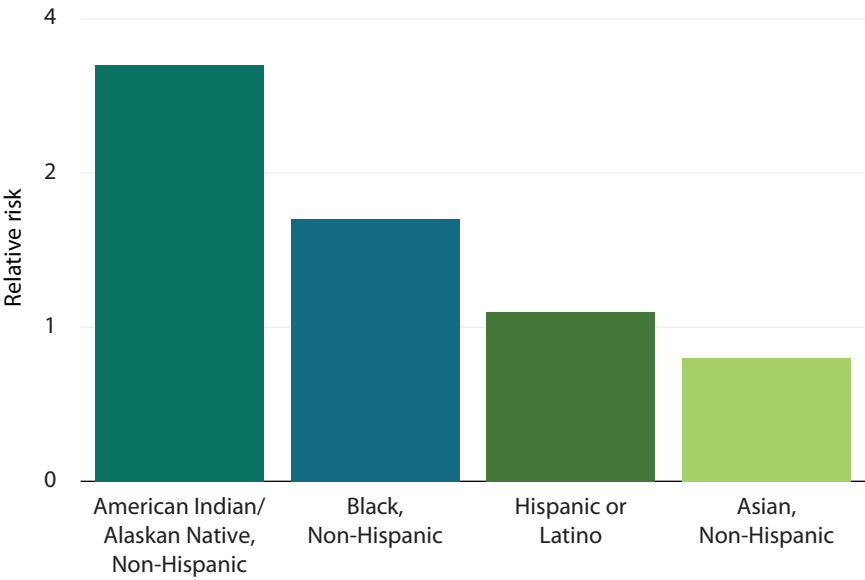


In the U.S., the COVID-19 downturn was sharp. In April 2020 the unemployment rate shot up to 14.7 percent, and there were steep declines in labor force participation and the employment-to-population ratio (Bureau of Labor Statistics [BLS] 2022). In May 2020, about one-third of all those employed were teleworking, and a quarter of those in the labor force were unable to work because an employer had closed or lost business due to the pandemic.

The ensuing economic recovery was faster and stronger than nearly any forecaster anticipated. For example, although expectations were generally for the unemployment rate to continue rising and output to continue falling, the economy began to recover by May 2020. In part that is because of the swift, aggressive, sustained, and creative response of U.S. fiscal and monetary policy.

As described in more detail in subsequent chapters, Congress responded forcefully to the pandemic and economic downturn—notably by passing the \$1.7 trillion Coronavirus Aid, Relief, and Economic Security (CARES) Act in March 2020, the \$1.9 trillion American Rescue Plan in March 2021, and several other smaller pieces of legislation. In all, Congress allocated more than \$5 trillion to the fiscal response—substantially more than it allocated during the Great Recession of 2008–9 (for details, see Table 1 in Chapter 1).

FIGURE 2
**Relative Risk for COVID-19 Death by Race/
 Ethnicity, Compared to White, Non-Hispanic
 Persons**



Source: Center for Disease Control and Prevention (CDC) 2022a.

Note: Estimates are age-adjusted.



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Households received substantial support through three rounds of Economic Impact Payments (EIPs) totaling \$3,200 per eligible adult and \$2,500 per eligible child, expanded Unemployment Insurance (UI), eviction moratoriums, and forbearance on mortgages and student loans. Businesses received more than \$1 trillion in subsidies and forgivable loans, and state and local governments received almost \$1 trillion dollars in grants. The Federal Reserve cut its key short-term interest rate to zero in March 2020 and held it there for two years, bought about \$5 trillion of Treasury and mortgage-based securities, and, with the encouragement of Congress, expanded its emergency lending beyond financial institutions to businesses and state and local governments.

Questions That Will Be Asked When the Next Recession Arrives

When the next recession arrives, it most likely won't be triggered by a pandemic. So when policymakers ask how best to respond to that recession, they will want to know: What did we learn from the economic policy responses to COVID-19? What should we consider repeating, perhaps with modifications? What should not be repeated?

The Hamilton Project and the Hutchins Center on Fiscal & Monetary Policy at the Brookings Institution gathered scholars with deep expertise to help answer these questions to the fullest extent possible with the available evidence. We know that the evidence is still incomplete, and scholars will be debating these questions for years to come. But we also know that the next recession may arrive before the answers are fully resolved. Indeed, assessing what we still don't know is as important as assessing what we do know. We asked the scholars to describe specific economic policy responses to the pandemic, summarize the available evidence about the outcomes of those policies, and analyze the lessons learned for future recessions. We asked them to try, as much as possible, to analyze the extent to which outcomes were pandemic specific and hence likely not applicable to the next recession. This project does not evaluate the public health response to the pandemic, as important as that was: we focus exclusively on the economic policy response.

In Chapter 1, Wendy Edelberg, Jason Furman, and Timothy F. Geithner trace the macroeconomic impact of the breadth of the economic policy responses that produced a recovery that was both stronger than generally anticipated and stronger than those of other advanced economies but has also been accompanied by an unwelcome increase in inflation.

This volume covers the expansion of UI (Chapter 2), the provision of EIPs (Chapter 3), loans and grants to businesses (Chapter 4), assistance to renters and mortgage holders (Chapter 5), and aid to state and local governments (Chapter 6). Subsequent chapters examine the efforts aimed specifically at children (Chapter 7); the reasons, including but not limited to Federal Reserve policy, that the U.S. Treasury was able to borrow trillions of dollars without pushing up interest rates (Chapter 8), and the use of nontraditional data to monitor the economy and guide policy (Chapter 9).

Overarching Lessons for the Next Recession

The authors of each chapter draw specific lessons learned from the economic policy responses to the pandemic. Looking across the variety of ways the government addressed the economic challenges posed by the pandemic, we (the three editors) draw a few overarching conclusions.

1. ***A strong, broad, and inclusive social insurance system provides effective relief to households as well as macroeconomic stimulus.***

Beneficiaries, like those who lose wages and receive UI benefits, tend to spend promptly much of what they receive. Sufficiently generous social insurance benefits can reduce the need for other sorts of assistance including aid to businesses, homeowners, renters, and even state and local governments.

2. ***The sizable fiscal and monetary policy response helped stabilize the economy.***

The U.S. has enjoyed a stronger economic recovery than other advanced economies: remarkably few businesses failed, few people lost their homes or were evicted, and state and local government budgets are still in good shape. Despite a surge in federal borrowing, long-term interest rates remain low, in part because of accommodative monetary policy. However, the combined fiscal and monetary policy response, particularly in the spring of 2021, was a factor behind the surge in inflation. Of course, inflation also was boosted by other factors such as disruptions to global and domestic supply chains and, more recently, by the spike in energy prices following Russia's invasion of Ukraine. It is too soon to know how history will judge the size of the fiscal and monetary policy response. If the uncomfortably high inflation rate is brought down over the next couple of years without too much pain, then the responses to the pandemic will likely be viewed as a significant economic policy success.

3. ***Generous Unemployment Insurance may have smaller disincentive effects than previously thought.***

During periods when demand for labor is low, even significantly enhanced UI appears to only modestly discourage recipients from returning to work. This suggests that boosting UI benefits would likely be worthwhile, particularly during recessions and probably in regular periods. In addition, the pandemic showed it is feasible to extend UI to many who previously have been ineligible and that the benefits of doing so seem greater than the costs.

4. ***Because standing up new programs quickly and targeting them is difficult, preparation is key.***

Federal and state governments should improve their administrative capacity *now*—including modernizing computer systems, improving communications across agencies and levels of government, and investing in data systems—to be better prepared to respond quickly to changing economic conditions. In addition, if it is deemed desirable to make some aspects of the novel pandemic-era policies permanent features of the response to recessions—such as the extension of UI to the self-employed—such policies should be designed and legislated now rather than waiting until the next recession.

5. *Sufficiently reliable, representative, and timely data on too many aspects of the economy are lacking.*

Slow-to-materialize and incomplete economic indicators made it difficult to assess needs during the pandemic and the lack of such data continues to make it difficult to fully evaluate the economic consequences of COVID-19. There are no comprehensive and timely data on renters, nor are there reliable, timely data on state and local expenditures. One argument for distributing EIPs so widely was to be sure to reach people who were hurt by the pandemic and weren't reached by targeted programs. However, it is almost impossible to know what fraction of EIP recipients had significant financial needs that were unmet by targeted programs or how many people, despite EIPs, nonetheless fell through the cracks. Merging administrative data with survey data and increasing the size of household and business surveys would help in real time as well as after-the-fact evaluations. Privately gathered data did help guide policy during the pandemic, but those data can be hard to interpret without consistent historical comparisons.

6. *Although Congress reacted quickly to provide generous relief in the spring of 2020, such prompt action may not occur in the future.*

Without such prompt, wide-reaching action to support the household sector, support for other sectors would be more critical than it was during the last two years (such as support for the business sector, state and local governments, and the housing market). More broadly, Congress should not assume that the swift recovery after March 2020 is a template for future recoveries. The pandemic was—we hope—a very unusual episode. Although we didn't know it initially, the pandemic was, economically, much more like a natural disaster—a devastating but brief disruption to economic activity followed by a rebound—than like the Great Recession and its protracted recovery. The strength of the economy in 2021 and the resilience of the labor market and the business sector reflect not only substantial fiscal and monetary stimulus but also the remarkably rapid development of and administration of vaccines that allowed businesses, workers, and consumers to begin to resume normal activities. In addition, the strength of the stock market and of house prices contributed to the vigor of the recovery; rising house prices and home equity were one reason that programs to help mortgage holders worked as well as they did and mostly seemed to support households who needed the help. However, rising wealth isn't a feature of every recession and recovery.

7. *Next time, support for the business sector should be better targeted.*

In the next recession we would not repeat the broad Paycheck Protection Program, the (largely forgivable) loans to businesses that were intended to prevent layoffs. Much of that money went to businesses that didn't need it and wouldn't have laid off employees in its absence. As a result, it largely resulted in a transfer to the business sector that did little to boost the economy. Nonetheless, in the future a more targeted program in a recession could reduce the number of bankruptcies of otherwise viable businesses, as described in Chapter 4.

8. *Next time, support for households should better reflect the state of the economy and the needs of households.*

Congress allowed programs to lapse prematurely in the summer and fall of 2020 and probably provided too much stimulus in the winter and spring of 2021. For example, the value of UI benefits swung wildly, with little connection to the state of the labor market. Most households received a sizable Economic Impact Payment in the spring of 2021 when perhaps more targeted and persistent support was warranted. Congress, therefore, should develop policies that respond automatically as economic conditions warrant, particularly when economic outcomes are so uncertain; for detailed proposals on such policies, please see The Hamilton Project and Washington Center for Equitable Growth volume *Recession Ready* (2019). Also, relative to what was done in the CARES Act in March 2020, we would make sure that increases in Supplemental Nutrition Assistance Program benefits be targeted at the poorest households and we would allow state and local governments more flexibility in using federal aid. Subsequent legislation was improved to these ends.

Assessing the Specific Economic Policy Responses

Unemployment Insurance

In Chapter 2, Peter Ganong, Fiona Greig, Pascal Noel, Daniel Sullivan, and Joseph Vavra review the substantial expansion of UI—supplementing state-provided benefits, expanding eligibility to those not traditionally eligible, and extending the duration of benefits at a cost to the federal government of roughly \$700 billion. They draw five conclusions. First, UI expansions were highly progressive in that they offset income losses and delivered the most benefit to lower-income workers. Second, UI benefits provided a powerful stimulus to the macroeconomy by boosting consumption. Third, work disincentive effects from UI benefits were small during the pandemic, especially when compared to history. Fourth, Congress increased access to benefits for workers on the margins of the labor market, and there is no clear evidence of greater work disincentive effects for them than for other workers. Fifth, the rapidly expanded UI programs faced a range of administrative challenges in meeting the surge in UI demand, including delays, unnecessary red tape, and overpayments, all of which were costly in terms of consumer welfare and government expense.

Economic Impact Payments

In Chapter 3, Michael Gelman and Mel Stephens examine the more than \$800 billion in cash that was distributed to all but the highest-income households in the three rounds of EIPs. Although there were delays in getting the money to some vulnerable, low-income households, electronic disbursement allowed

the Treasury to make payments quickly—about two weeks after the initial legislation was signed and even more quickly in the subsequent rounds. The available evidence suggests that the payments led to a rapid increase in spending; consumers spent about the same or a smaller fraction of these payments than they did in similar payments in past downturns. The payments were not, of course, well targeted. Some households that weren't adversely affected by the pandemic received the money, but other recipients were adversely affected but weren't eligible for or didn't promptly receive more targeted benefits (such as UI or rental assistance) and were greatly aided by the EIPs.

Support for Business

In Chapter 4, Gabriel Chodorow-Reich, Ben Iversen, and Adi Sunderam survey the new federal subsidies and loans provided to businesses in the first year of the pandemic—including the Paycheck Protection Program (PPP), the Economic Injury Disaster Loan (EIDL) program, and aid targeted at specific industries such as airlines and restaurants—and also examine the additional lending and corporate bond purchases by the Federal Reserve. They observe that businesses overall fared much better during the pandemic recession and recovery than had been expected at the outset. In sharp contrast to past recessions, for instance, business bankruptcies fell during the pandemic. Many large firms continued to have access to private credit markets. They conclude that policies to support small businesses could have achieved their objective at a much lower cost to the federal government had the programs been more targeted. They find no credible evidence that the largest PPP loans had any substantial positive effect on employment. Loans through the EIDL program, which unlike the PPP loans were not forgivable, were better targeted. The Federal Reserve's support for bank lending to business had little direct impact, in large part because banks were in much better shape than they were during the Great Recession. However, the Fed's interventions in the corporate bond market had an important stabilizing effect in the early months of the pandemic in 2020. The authors caution policymakers against blindly deploying the 2020 tool kit, judging that the resiliency of the business sector reflects the unusual nature of the lockdown and reopening, and the substantial fiscal aid to households, more than it does the aid targeted directly at businesses. They also question the wisdom of providing federal aid to some large firms, such as airlines, that have a history of successful bankruptcy resolution.

Housing

Chapter 5 is divided in two. In the first part, Kristopher Gerardi, Lauren Lambie-Hanson, and Paul Willen review the aid offered to the roughly 50 million homeowners with mortgages included in a forbearance program (on top of EIPs and UI) and the Federal Reserve's actions that pushed down mortgage rates, allowing many mortgage holders to reduce their monthly payments by

refinancing (Census Bureau n.d.). They deem these policies to be quite effective in relieving financial distress and allowing homeowners to stay in their homes, especially in contrast with the policies pursued during the Great Recession. They emphasize that these policies in part worked because of rising housing prices and home equity, before and during the pandemic, and note that such conditions might not hold in future downturns. They observe that minority mortgage borrowers were much more likely to miss mortgage payments, so forbearance was particularly important to them. Black and Hispanic borrowers, however, were less likely to refinance than white or Asian borrowers.

In the second part, Laurie Goodman and Susan Wachter evaluate aid offered (again on top of EIPs and UI) to the 44 million renting households. These include federal, state, and local eviction moratoriums and the two rounds of Emergency Rental Assistance (up to \$25 billion allocated by Congress in December 2020 and up to \$21.55 billion more allocated in March 2021). However, the distribution of financial assistance was distressingly slow. Data on renters are unfortunately skimpy, a major impediment to precisely measuring the effects of these policies. General income replacement might have sufficed if policymakers were concerned only with the negative effect of the recession on renters' finances, but the eviction moratoriums and Emergency Rental Assistance were particularly important to those struggling to make their rental payments before the recession. Eviction moratoriums, while particularly justified in a pandemic, impose hardships on landlords.

Aid to State and Local Governments

In Chapter 6, Louise Sheiner looks at the nearly \$1 trillion that the federal government provided to state and local governments. The federal aid was more than sufficient to offset the declines in state and local revenues, which were not nearly as severe as initially feared, in part because the relationship between economic conditions and state and local revenues during the pandemic differed significantly from historical experience. Nevertheless, state and local government employment declined sharply, and the decline has been quite persistent: employment at state and local governments in February 2022 was 3 percent below the pre-pandemic level, accounting for roughly one-quarter the shortfall in total employment in the U.S. from its pre-pandemic trend. She concludes that much of the decline in employment reflected the unique nature of the pandemic rather than tight budgetary conditions. However, she also argues that had state and local policymakers known about the full extent of forthcoming aid, had the aid been more flexible, and had it been provided directly to more local governments, the layoffs likely would have been somewhat smaller. Finally, she cautions against using the unique pandemic experience as a reason to discard the lesson of the Great Recession that aid to state and local governments is critical to ensure a strong economic recovery.

Children

In Chapter 7, Anna Aizer and Claudia Persico examine the impact of the pandemic and related policy responses on children. In 2020 the combined effect of several government programs—EIPs, UI, and the expansion of the Supplemental Nutrition Assistance Program—reduced the percentage of children living in poverty (measured by the Supplemental Poverty Measure) from 12.6 percent in 2019 to 9.7 percent. Child poverty likely fell again in 2021 because of continued support for households and the expansion of the Child Tax Credit. The authors note that the pandemic hit child-care providers particularly hard; child-care employment fell much more sharply than in typical recessions, and many child-care centers closed despite billions in federal aid and forgivable loans. Much of that aid came too late to avoid closures, a mistake that should not be repeated. Federal efforts to prevent a decline in health insurance coverage, including through Medicaid and Affordable Care Act exchanges, were largely successful. The expansion of SNAP benefits reduced food insecurity. The provision of debit cards to purchase groceries for students eligible for free or reduced-price lunch (including the undocumented) while schools were closed was slow to roll out but ultimately very successful. While some elements of the pandemic were unique, such as the suspension of in-person schooling, available evidence underscores the importance of cash and near-cash transfers in reducing poverty as well as housing and food insecurity among families with children.

Interest Rates and Monetary Policy

In Chapter 8, Robin Brooks and Jonathan Pingle examine the role of monetary policy in keeping interest rates low in the wake of a surge in federal borrowing to assess whether a similar increase in borrowing could be repeated in future recessions. They note that despite the huge increase in federal borrowing, some traditional buyers of U.S. Treasury debt—including foreigners and domestic investors—did not increase their holdings on net outside of accounts that had a regulatory incentive to hold Treasuries. It's too soon to know if the pre-pandemic trend toward lower global interest rates will persist or be reversed. During the pandemic, the upward pressure on interest rates from substantial U.S. borrowing was offset by factors other than monetary policy that keep rates from rising. Policymakers should not assume that will always be the case. They conclude that the Federal Reserve's purchases of more than \$3.3 trillion in U.S. Treasury debt helped dampen rates and estimate that the yield on 10-year Treasury notes would have been 0.70 percentage points higher if not for the Fed's purchases. Whether the Fed can and will repeat this in future downturns depends, in large part, on whether it can tame the current surge of inflation and on the inflationary environment when the next recession arrives.

Nontraditional Data

In Chapter 9, Tomaz Cajner, Laura Feiveson, Christopher Kurz, and Stacey Tevlin examine the use and value of nontraditional data sources, such as private payroll service providers and restaurant reservation services. They identify three main benefits of such data. First, these data are often available much earlier than the data provided from government surveys, an important feature at times like March 2020, when the economy was changing direction abruptly. Second, these data are often more granular—covering particular geographies or demographic groups, for instance—and that can allow for faster evaluations of the cost of shocks or the benefits of policies, which, in turn, can help fine-tune policies. And, third, nontraditional sources can provide information unique to a particular crisis. But the cost to the government of nontraditional, privately gathered data can be substantial. Historical time series are not always available, which can make interpreting the data challenging. Privately gathered data are not always representative or gathered with the same methodological rigor as government economic indicators. Still, the benefits of nontraditional data are greater than the costs.

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Lessons Learned from the Breadth of Economic Policies during the Pandemic

Wendy Edelberg, Jason Furman, and Timothy F. Geithner¹

Introduction

The emergence of COVID-19 and the policy and public response to it led to the fastest, sharpest, and most synchronized reduction in global economic activity in history. The United States shed 22 million jobs in just two months and the U.S. economy was 10 percent smaller in the second quarter of 2020 than it had been just two quarters earlier.

The pandemic unleashed an enormous amount of human suffering and disruption, including a U.S. death toll of approximately one million (Centers for Disease Control and Prevention [CDC] n.d.). The economic policy response was largely successful in protecting households from the economic impacts of the pandemic, however, and also helped foster a strong economic recovery. Real disposable personal income actually rose in 2020 and 2021 as transfer payments from the government vastly exceeded lost incomes from other sources. As a result, poverty, after accounting for taxes and transfers, fell in 2020 to the lowest level since the data series began in 1967. Even more notable, child poverty rates fell to their lowest level, despite the sharp economic downturn.

Financial markets were very strained in February and March 2020. Observers and policymakers worried that a cascade of bankruptcies and defaults could precipitate a financial crisis. But improvements to make the financial system more resilient in the wake of the global financial crisis and the policy response

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to the COVID-19 crisis quickly addressed potential issues. Financial conditions during the pandemic were marked by low interest rates, an absence of funding strains, a soaring stock market, and virtually no bank failures.

The U.S. economy experienced a V-shaped recovery of a type not seen in recent recessions. Real Gross Domestic Product (GDP) exceeded its pre-pandemic level by the second quarter of 2021 and was close to pre-pandemic estimates of potential by the fourth quarter of 2021. The unemployment rate ended 2021 below 4.0 percent, just slightly above where it was two years earlier, prior to the pandemic.

The rapid recovery was due to two factors. The first factor is that the recession itself was caused by a transitory shock associated with COVID-19; as that shock retreated—and people learned to better live with the pandemic—the economy was poised to recover quickly, just as it typically does after natural disasters and appears to have done after the 1918–19 influenza pandemic. The second factor is the policy response that protected household incomes and kept many businesses intact so that they were in a position to resume more normal levels of economic activity when it was safe to do so.

Overall, the United States' fiscal response appears to have been much larger than the response undertaken by any other country; this was especially true in 2021, when fiscal policy was as supportive as it was in 2020. The U.S. GDP recovery has been among the strongest of any of the advanced economies, but the U.S. employment recovery has been among the weakest; this suggests that both the size of the response and, perhaps, its character and preexisting institutions all matter.

The COVID-19 pandemic is not over, and additional surges and mutations are likely as it transitions to being endemic. As of this writing, there are more than 900 COVID-related deaths every day in the United States and cases are trending upwards (CDC n.d.). The economy is not yet normal: there is a shortfall in the workforce of about two million workers relative to pre-pandemic projections (adjusted for changes in population growth), and spending is still restrained in pandemic-sensitive areas like travel and in-person events.

The economy experienced major side effects from the pandemic and associated policy response, most notably the highest inflation rate in 40 years, far outpacing the increase in wages and leading to the largest real wage declines in decades. In addition, the U.S. government incurred substantial debt during the pandemic. With the expiration of most forms of fiscal support, real household income is likely to be lower in 2022 than in 2021 and could well be below its pre-pandemic trend. As a result, poverty is on track to rise in 2022. Moreover, inflationary pressures and the efforts to moderate those pressures might bring an end to the expansion.

Ultimately, the economic policy response to the COVID-19 recession should be judged not just by its consequences in the spring of 2020, not what happened over the next two years, but also by the longer-term effects, and whether the response will prove to have contributed to a stronger and more sustainable economy going forward.

Even though the book is not yet closed on COVID-19 and the longer-term consequences of the economic policy response, the significant fiscal policy responses to the pandemic are probably behind us. This is a good time to reflect on the overall response: on the successes, the mistakes, and, most importantly, on what lessons we can learn for the future.

This chapter concentrates on the economic response to the crisis. It does not address the health response to the crisis, which itself had important economic implications, in some cases helping to strengthen the economy (e.g., vaccinations and masks) and in other cases deliberately reducing economic activity in order to save lives (e.g., shutdowns). Our focus is to mostly set aside issues specific to what hopefully will be a once-in-a-lifetime pandemic to extract broader lessons that can be generalized to more typical economic downturns.

The Pandemic and the Policy Response

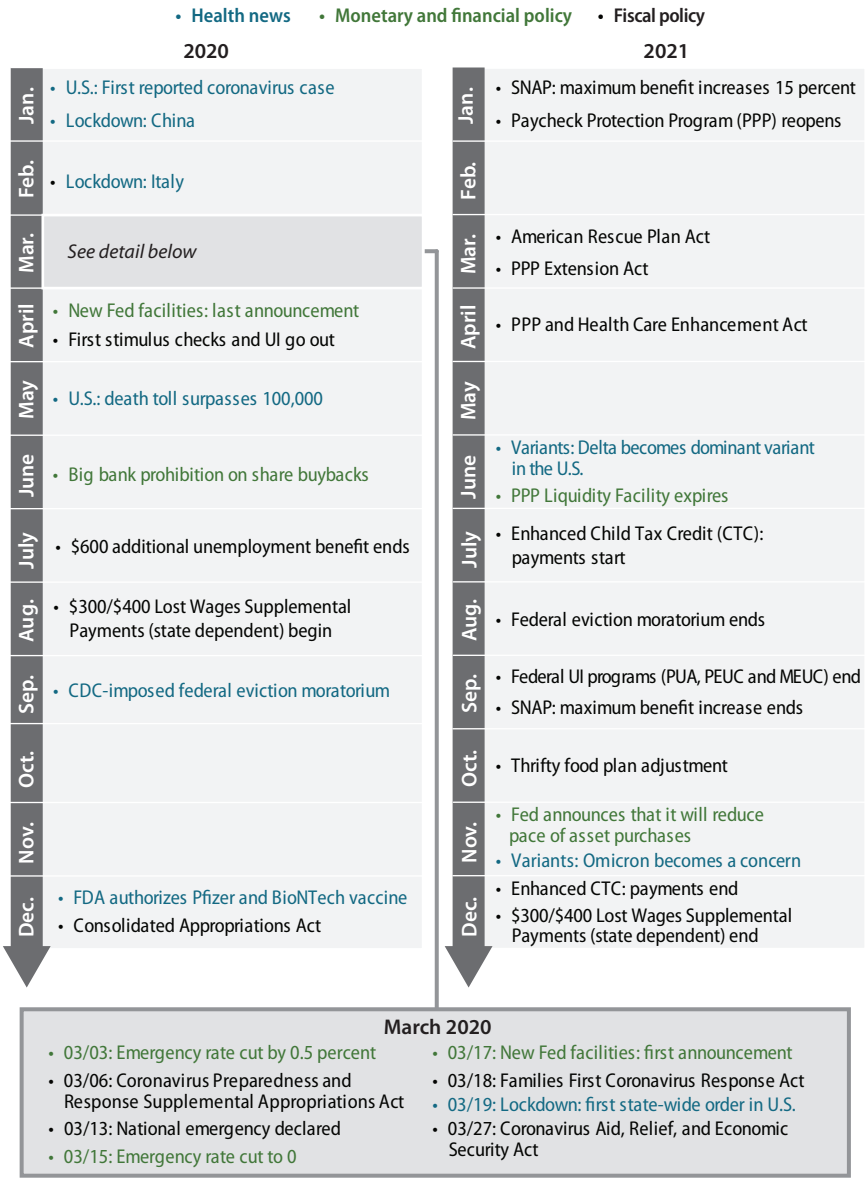
The first COVID-19 cases were reported in the United States in January 2020. The stock market started declining rapidly in February as it responded to the global economic news and the significant increase in risk. By mid-March 2020—when there had been only a few dozen confirmed COVID-19 deaths in the United States—the widespread public reaction to COVID-19 led to rapid and dramatic pullbacks in consumer and business economic activity, many of which preceded the government’s social distancing rules (Chetty et al. 2020). Over the next two years, dramatic changes in the health consequences of the pandemic, fiscal responses, and public attitudes all affected the economy. After the initial wave of the pandemic, the Delta variant took hold in the summer of 2021 and the Omicron variants later in the fall of 2021 and the winter of 2021–22.

The initial fiscal response in the U.S. was large. It waned in mid-2020 and then surged again in late 2020 and early 2021. In 2020 the response was bipartisan, with both parties coming together in March and December 2020 to pass COVID-related legislation. These responses were complemented by actions of the Federal Reserve (Fed) and other parts of the government: the Federal Open Market Committee (FOMC) lowered the federal funds rate to zero, new Fed facilities were opened to help stabilize financial markets, President Trump declared a national emergency, and the first statewide lockdowns were ordered (Figure 1.1). This economic response did not just help the economy. It also likely helped save lives by supporting and enabling health measures that restricted face-to-face economic activity in order to limit the spread of the virus.

In addition, attitudes toward the pandemic have shifted significantly, with some countries and U.S. states returning close to pre-pandemic patterns and others still experiencing social distancing and reductions in economic activity. Overall, the effect of COVID-19 on the U.S. economy waned even in the midst of the pandemic: in January 2022, even as the seven-day average of daily COVID-19 cases topped 800,000 and daily COVID-19 deaths topped 3,000, the economy added 481,000 jobs.

FIGURE 1.1

Major Policy Actions, 2020 and 2021



Source: AP News 2021; Ballotpedia 2020–2022; Board of Governors of the Federal Reserve System 2021; Centers for Disease Control and Prevention 2020; Cox 2020; Federal Register 2020; Giuffrida and Cochrane 2020, McCarty and Perl 2021; Milstein and Wessel 2021; Lane 2020; Liesman 2020; Lorenzo 2020; Reinicke 2021; Sablik 2020; State of California 2020; U.S. Department of Agriculture 2021a and 2021b; Wade 2021.

The COVID-induced economic crisis was unlike any other U.S. recession. The sharp decline and rebound in activity had the hallmarks of the response to a natural disaster, such as a hurricane or blizzard. But, in the case of COVID-19, the disaster was not localized to any one part of the country and is ongoing more than two years later. Nonetheless, the comparison is helpful for understanding the forces underlying the economic recovery and the goals of policy. At least initially, and to some degree for the year and a half following the onset of the pandemic, the principal goal of policy was not to stimulate economic activity, but rather to allow people to forgo the activities that spread the virus. For example, a principal goal of Unemployment Insurance (UI) early in the crisis was to keep people from working in face-to-face industries, a policy deliberately designed to complement and reinforce other efforts to limit economic activities that were spreading the virus (House Committee on Ways and Means 2020).

The Fiscal Policy Response

In March 2020 fiscal policymakers took significant action. Two pieces of legislation related to the pandemic were enacted by March 18, increasing federal spending and lowering tax revenues by a total of \$200 billion. At the end of March, the Coronavirus Aid, Relief and Economic Security Act (CARES Act) was enacted, with increases in spending and reductions in revenues totaling \$1.721 trillion.

Several other major pieces of legislation also provided substantial fiscal support. On December 27, 2020, the Consolidated Appropriations Act of 2021 provided an additional \$868 billion in fiscal support. On March 11, 2021, the American Rescue Plan provided \$1.92 trillion. In addition, the Paycheck Protection Program and Health Care Enhancement Act, enacted on April 24, 2020, provided up to \$483 billion in support for businesses and health-care providers. Together, all the pandemic-related legislation increased the deficit over the next decade by more than \$5.2 trillion (Table 1.1). Given the expected timing of the increases in federal spending and decreases in revenues at the time that legislation was enacted, the effect of the fiscal support on the federal deficit was estimated to total 10.4 percent of GDP in fiscal year 2020 and 11.0 percent of GDP in fiscal year 2021.

That fiscal support was far more significant and much more front-loaded than the support enacted in the wake of the Great Recession, which was at the time the largest discretionary fiscal response to an economic crisis. As shown in Figure 1.2, legislation enacted in 2008 and 2009 increased the deficit by a relatively modest amount as a share of GDP—by less than 2 percent. In fiscal years 2010 and 2011, the fiscal support provided to the economy by legislation was larger, averaging roughly 3 percent. In retrospect, the fiscal support in the wake of the Great Recession is widely considered to have been too small—a conclusion that was often discussed in debating how much support should be provided to the economy in response to the COVID-19 crisis.

Legislation enacted since March 2020 offered substantial support to households, businesses, and state and local governments through a wide variety of

TABLE 1.1

Deficit Impact of Legislation Related to COVID-19

Date	Law	Estimated Effect on Deficit Over 10 Years (in billions)	Deficit Effect as a Share of GDP	
			2020	2021
3/6/2020	Coronavirus Preparedness and Response Supplemental Appropriations Act	8	0.01%	0.02%
3/18/2020	Families First Coronavirus Response Act	192	0.64%	0.25%
3/27/2020	Coronavirus Aid, Relief, and Economic Security (CARES) Act	1,721	7.67%	2.00%
4/24/2020	Paycheck Protection Program and Health Care Enhancement Act	483	2.07%	0.19%
12/27/2020	Consolidated Appropriations Act	868	N/A	3.29%
3/11/2021	American Rescue Plan	1,921	N/A	5.20%
3/30/2021	PPP Extension Act of 2021	15	N/A	0.07%
Total		5,208	10.39%	11.03%

Source: Congressional Budget Office 2020b, 2020c, 2020d, 2020e, 2021a, 2021c, and 2021d; Bureau of Economic Analysis n.d.a; authors' calculations.



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Note: N/A indicates the legislation was enacted after fiscal year 2020.

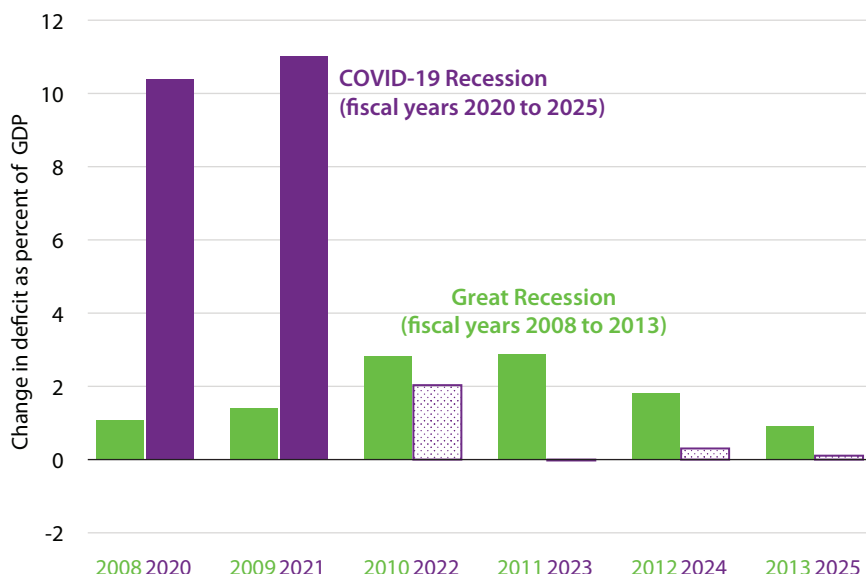
Deficit effects as share of GDP are the fiscal year deficit effects as scored by CBO as a share of actual Gross Domestic Product (GDP) for each fiscal year.

programs. Using estimates that largely rely on analysis provided by the Committee for a Responsible Federal Budget (CRFB), households and individuals received more than one-third of the COVID-19-related legislated funds through expanded UI benefits and other income support, direct payments, and other programs, such as forbearance programs that paused existing debt payments on federally backed mortgages and student loans. Businesses received a little less than one-third (largely through grants and subsidized loans), and state and local governments, health providers, federal agencies, and a collection of other recipients received roughly one-third (CRFB n.d.).

In addition to fiscal support through increases in federal spending and reductions in federal revenues, the federal government put in place other changes that supported households. For example, one was a foreclosure moratorium on federally backed mortgages, which was largely extended by the private sector to other mortgages as well. Another was a federal eviction moratorium for renters that was in place through August 2021 (see Chapter 5).

FIGURE 1.2

Fiscal Policy Responses to COVID-19 Recession and Great Recession



Source: Bureau of Economic Analysis n.d.a; Congressional Budget Office 2008a, 2008b, 2008c, 2008d, 2015, 2020b, 2020c, 2020d, 2020e, 2021c, and 2021d, and 2021e; Council of Economic Advisors 2014; authors' calculations.



Note: GDP for fiscal years 2020 and 2021 are as reported. Patterned bars are based on values for GDP projections from CBO in July 2021. For the COVID-19 recession, the legislation included is as shown in Table 1. The legislation included in response to the Great Recession are the Economic Stimulus Act of 2008, the Housing and Economic Recovery Act of 2008, the Unemployment Compensation Extension Act of 2008, the American Recovery and Reinvestment Act of 2009 (net of the Alternative Minimum Tax “patch” which is treated as routine policy), and various bills outlined in Council of Economic Advisors (2014). Data do not include the Troubled Assets Relief Program or certain other provisions included in pre-Recovery Act stimulus bills.

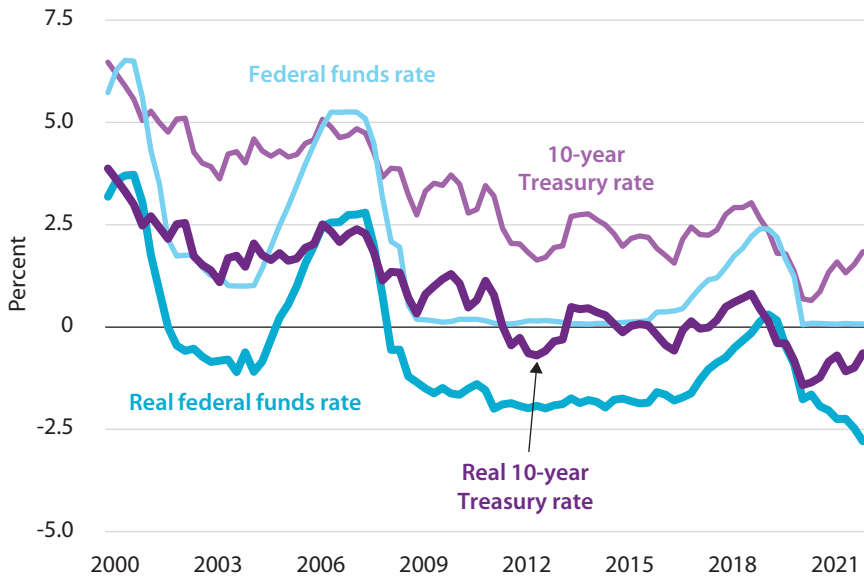
The Monetary Policy Response and Interest Rates

The Fed took a wide array of actions to make monetary policy very accommodative and to stabilize financial markets and credit markets. Those actions are summarized here; for much more detail, see Chapter 8.

The FOMC announced emergency rate reductions following meetings on March 3 and March 15, bringing its policy rate to zero, where it stayed until mid-March 2022. Although the nominal rate remained unchanged throughout this period, an increase in the rate of inflation meant that the real federal funds

FIGURE 1.3

Real and Nominal Interest Rates, 2000Q1–2022Q1



Source: Federal Reserve Bank of New York 2022; Federal Reserve Bank of Philadelphia 2022; U.S. Department of the Treasury 2022; authors' calculations.

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Note: Figure presents quarterly average rates for all series; the first quarter of 2022 is approximated based on data through mid-March 2022. The real federal funds rate is the nominal rate less expected inflation in the year ahead according to the median response of the Survey of Professional Forecasters (SPF). The real 10-year Treasury rate is the nominal rate less the median SPF inflation projection for the next 10 years.

rate declined sharply, as shown in Figure 1.3. To the degree that households and businesses are responsive to the lower real costs of short-term borrowing, monetary policy was effectively more expansionary at the beginning of 2022 than it was as the economy was going through the worst of the COVID-19 crisis in the spring of 2020.

At the same time, the FOMC significantly expanded its purchases of U.S. Treasury securities and, to a lesser degree, mortgage-backed securities. Initially, the primary effect was to stabilize financial markets in March 2020. Over time, the effect was to put downward pressure on longer-term interest rates, over and above the sharp reduction in longer-term rates on Treasury securities owing to an increase in investor demand for low-risk assets. (See Chapter 8 for a discussion of the effect of asset purchases on interest rates.) Taken together, the result was that the 10-year Treasury rate fell to an all-time

low of 0.6 percent in the summer of 2020. With a taper of asset purchases by the Fed, greater optimism about future economic growth, and an increase in inflation, by mid-March 2022 the nominal 10-year Treasury rate had largely recovered to pre-pandemic levels. However, given the increase in expected inflation, real rates went from roughly zero prior to the pandemic to solidly negative after early 2020.

The Fed also opened a number of facilities to support the flow of credit. Although terms were set so that the facilities were unlikely to lose money in aggregate, in most cases they were backstopped by money appropriated by Congress. For the most part, the terms of the credit facilities were stringent enough that they were not highly used. The evidence, however, suggests that some facilities were constructive in restoring enough confidence to revive credit markets. (See Chapter 4 and Chapter 6 for more discussion.) In addition, the Fed took supervisory and regulatory actions to support credit markets. For example, federal bank supervisors indicated that COVID-19-related loan modifications would not trigger the usual reporting requirements that follow troubled debt restructurings. In addition, some regulatory capital requirements were eased. Only four banks failed in 2020 (the same number as in 2019) and none failed in 2021—a testament both to the policy response and to the overall health of the banking system going into the crisis; the health of the banking system reflected both business changes prior to the pandemic and policy reforms like the Dodd-Frank Act and greater capital requirements.

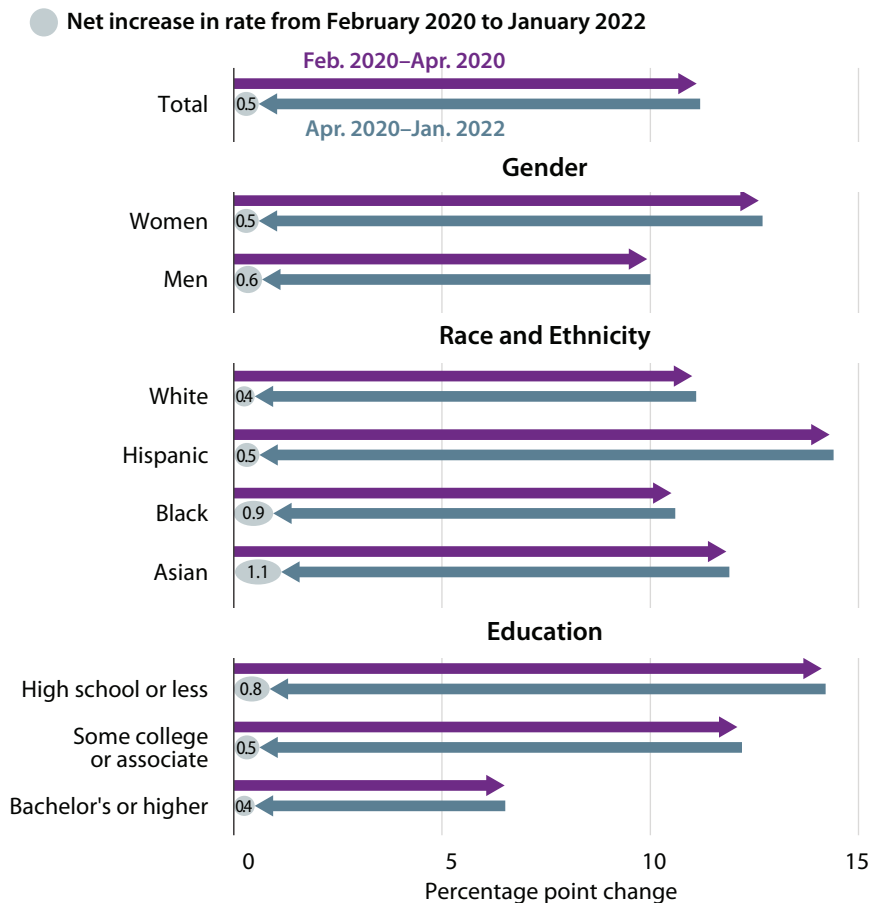
As a result of the Fed's actions and the quick improvement in the economic outlook, the flow of credit generally continued. For example, banks reported tightening standards on commercial and industrial loans from the second quarter of 2020 through the first quarter of 2021. But, since then, loan standards have eased (Board of Governors of the Federal Reserve System 2022). At the same time, the demand for such loans fell over 2020 but has improved since the second half of 2021. In addition, the spread between the Baa corporate bond yield and the 10-year Treasury rate jumped in March 2020 from 2 percentage points to 4 percentage points, but recovered far more quickly than after the Great Recession and was at or below pre-pandemic levels from April 2021 to February 2022.

Recent Trends in Income and Poverty Rates

The economic fallout of the COVID-19 recession disproportionately affected lower-income households and certain racial and ethnic groups. Unemployment rates rose more dramatically for workers with a high school diploma or less and those with some college experience or an associate's degree than they did for workers with a bachelor's degree or higher. College graduates with a bachelor's degree were more likely to be able to shift to remote work and continue their jobs (Figure 1.4). In addition, the unemployment rate rose most for Hispanic workers among all racial and ethnic groups, and rose more for women than

FIGURE 1.4

Increase and Subsequent Decrease in Unemployment Rates, February 2020 to January 2022



Source: Bureau of Labor Statistics n.d.a; authors' calculations.

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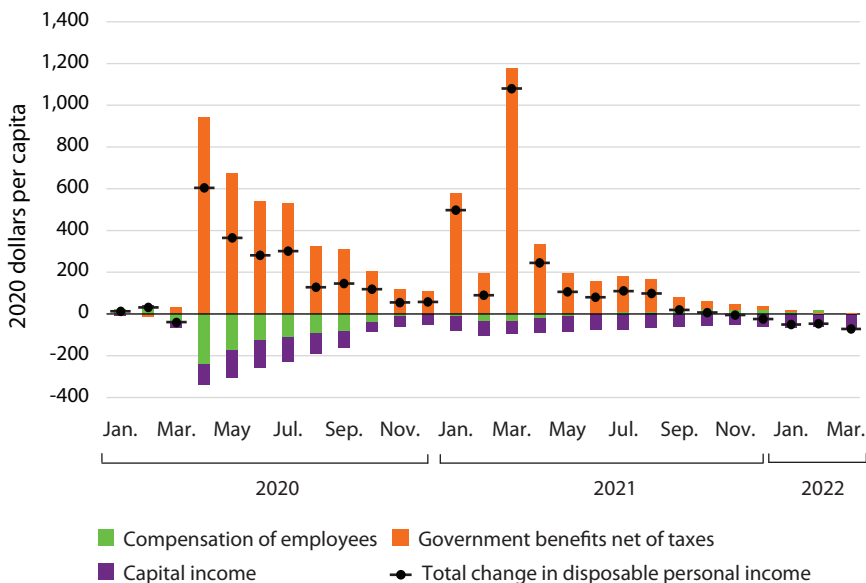
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for men. Although unemployment rates have come down significantly from their peaks in the spring of 2020, rates remain relatively elevated for Black and Asian workers and for workers with less formal education.

Although the increase in unemployment in 2020 meant sharp declines in labor income, the policy response more than cushioned the decline for most workers, leading to increases in disposable personal incomes (which includes

FIGURE 1.5

Components of Per Capita Real Disposable Income Relative to 2018–19 Trend



Source: Bureau of Economic Analysis n.d.b; authors' calculations.

Note: Bars denote change in per capita disposable personal income (DPI) components while circle-studded line denotes overall monthly change in net DPI per capita relative to pre-pandemic trends. Government benefits net of taxes include income from Social Security, Medicare, Medicaid, Unemployment Insurance, Child Tax Credits, Economic Impact Payments, the value of Paycheck Protection Program forgivable loans to proprietors and non-profit institutions, and other federal and state social benefits, less personal taxes and contributions to social insurance. Capital income includes proprietors' income, rental income, income from assets, and net transfer receipts from businesses. Pre-pandemic trends are computed separately for each component shown, based on log-linear regression for January 2018 to December 2019.



taxes and transfers) for the average household. The gains were particularly large for low- and moderate-income households and brought poverty rates down to the lowest level ever recorded.

As shown by the black circles in Figure 1.5, real disposable personal income per capita was well above recent trends in most months since March 2020 but has recently fallen increasingly below trend as benefits have ended and inflation has risen. The contribution of government benefits net of taxes is shown by the orange bars. The cumulative above-trend benefits from March 2020 through March 2022 totaled nearly \$6,900 for the average person (and about twice that for the average household), which is about 2.5 times larger than the cumulative total \$2,800 loss in compensation and other income.

But those benefits came in waves. Indeed, after significant fiscal support early in the pandemic, government benefits fell dramatically in the fall of 2020, significantly dampening aggregate disposable income, and leaving some households in much the same or even worse financial straits than before the pandemic. In December 2020 legislation once again provided support, namely through another round of Economic Impact Payments (EIPs; i.e., payments to households) and increased UI generosity, leading to a surge in aggregate disposable income in January 2021. In March 2021 the American Rescue Plan provided the third round of EIPs, maintained expanded UI, and made the Child Tax Credit (CTC) fully refundable and more generous, significantly increasing after-tax income for low-income families with children under the age of 18 in the household.

Some programs boosted household resources but are not reflected in disposable income. Those include forbearance programs that paused existing debt payments on federally-backed mortgages and the allowance of penalty-free early withdrawals from retirement plans.

Survey data through the end of 2020 show that people with less formal education benefited the most from the enormous fiscal support. Money income—which includes cash income from work, UI benefits, pension disbursements, investments, and the like, but does not include other kinds of income such as EIPs or in-kind benefits—fell more for lower-educated workers; this reflects the regressive nature of the job and income losses associated with the pandemic. But posttax income—which includes EIPs—rose more for lower-educated workers than for higher-educated workers (see Figure 1.6) according to survey data, since the fiscal response more than compensated for reported market income losses.

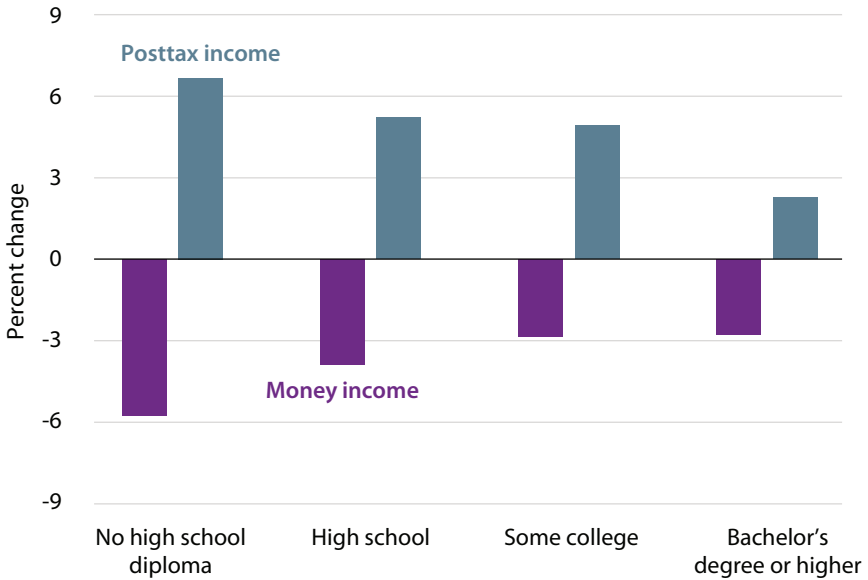
As a result, the increase in government benefits led to a large reduction in poverty rates in 2020. The percentage of the U.S. population in poverty, as measured by the Supplemental Poverty Measure, which incorporates the effect of benefits, fell from 12 percent in 2019 to 9 percent in 2020 (Figure 1.7). For some demographic groups, the reductions were even larger. For example, the share of Black people in poverty fell by 4 percentage points in 2020 and the share of Hispanic people in poverty fell by 5 percentage points. In addition, the share of children under age 18 and adults over age 65 in poverty fell by more than the share of adults between 18 and 64 years old who are in poverty.

The two new policies in 2020 that had the most significant effects on poverty relative to earlier years were the expansion of UI and the EIPs. In particular, the U.S. Census Bureau (2021) estimates that, rather than falling to 9 percent, the Supplemental Poverty Measure poverty rate would have risen to 13 percent in the absence of the EIPs that were issued in the spring of 2020 and the winter of 2020–21, and to 14 percent if, in addition, UI benefits had not increased (assuming that labor market income remained unchanged despite a significantly different amount of fiscal support) (Chen and Shrider 2021; Fox and Burns 2021).

Continued fiscal support in 2021—particularly the full refundability of and increase in the CTC and increases to the Supplemental Nutrition Assistance

FIGURE 1.6

Change in Real Median Household Income by Educational Attainment of Householder, 2019–2020



Source: Shrider et al. 2021.

Note: Income is reported by Current Population Survey respondents and is inflation adjusted using the Consumer Price Index for all urban consumers retroactive series (CPI-U-RS). Money income is total pretax cash income, including Unemployment Insurance benefits, and excluding imputed income and in-kind transfers. Posttax income is money income plus Economic Impact Payments, net of all federal and state taxes and credits and payroll taxes. A householder is the person in whose name the housing unit is owned or rented.

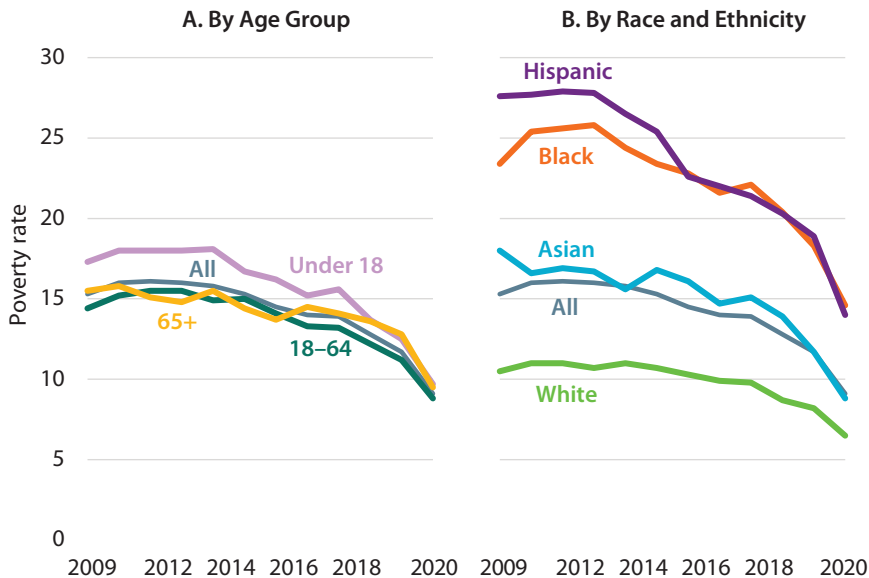


Program (SNAP) maximum benefit—as well as the continued labor market recovery, likely helped lift additional households out of poverty. Indeed, researchers find that poverty rates continued to fall in 2021, particularly for children (Macartney et al. 2022).

Many of the favorable outcomes for disposable incomes and poverty rates in 2020 and 2021 were the result of temporary fiscal support that raised income above pre-pandemic levels. With lapsing of that support, real disposable personal income per capita is on track to fall sharply in 2022 relative to 2020 and 2021, and could even fall short of its pre-pandemic trend. Poverty rates, especially for children, are likely to rise sharply in 2022. Some of that increase would be mitigated by the extension of the full refundability of the CTC being

FIGURE 1.7

Poverty Rates after Taxes and Transfers, 2009–2020



Source: U.S. Census Bureau 2021.

Note: Poverty rates shown as the Supplemental Poverty Measure, which reflects government benefits not included in the official poverty measure.



considered by lawmakers, a change that would be particularly effective at reducing child poverty.

The Economic Recovery

The COVID-19 shock to the economy was sharp and short. Real GDP recorded its steepest quarterly drop in economic output on record, with a decrease of 10.1 percent in the first half of 2020. The recession as formally defined lasted only two months (February and March 2020), the shortest on record. Nevertheless, the economy remained below its pre-COVID-19 projections through the end of 2021, with elevated unemployment and reduced labor force participation. Overall, however, the recovery was much faster than in other recent recessions. That likely reflects both the fact that the recession was caused by a pandemic, creating the sharp decline and quick partial rebound, and the significant fiscal and monetary support.

Although the enormous fiscal support certainly provided a significant boost to real GDP, any effort to quantify that boost is subject to great uncertainty.

Nonetheless, some calculations are informative. For example, in September 2020 the Congressional Budget Office (CBO) estimated that the pandemic-related legislation enacted at that point would boost the level of real GDP by 6.4 percent at the end of 2020 and by an average of 3.2 percent in 2021 (CBO 2020h). Those effects primarily reflected boosts to spending by individuals, firms, state and local governments, and health-care providers. At that time, CBO expected inflation to remain muted. That analysis did not incorporate any effects on consumer or business confidence from the legislation, although it notes those effects were positive. It is a difficult exercise, however, to contemplate economic conditions in 2020 had no pandemic-related legislation been enacted. Arguably, the absence of any fiscal or monetary policy response in the spring of 2020 would have been catastrophic—either for the economy or by forcing a premature economic reopening that would have been even more devastating, with even more lives lost.

The fiscal support enacted at the end of 2020 and in March 2021 also boosted real GDP, but (as was expected by some at the time and as is clearer in retrospect) that later fiscal support contributed to an increase in demand that was not matched by an increase in supply; the result of this mismatch was greater inflation. In reports released in February and July 2021, CBO estimated that pandemic-related legislation enacted in December 2020 and in March 2021 would boost the level of real GDP by 2.8 percent in 2021, such that late in the year GDP would surpass its pre-pandemic projected path (CBO 2021b; CBO 2021e). Then the level of GDP would be boosted by 3.8 percent in 2022. At the same time, CBO noted the resulting inflationary pressures, and projected Consumer Price Index (CPI) inflation of 3.3 percent in 2021. In a similar vein, Edelberg and Sheiner (2021) analyzed the economic effects of a package similar to the one enacted in March 2021, and estimated that it would boost real GDP in 2021 by 1.9 percent, pushing real GDP above its pre-pandemic projected path; they also noted that the package would create inflationary pressure.

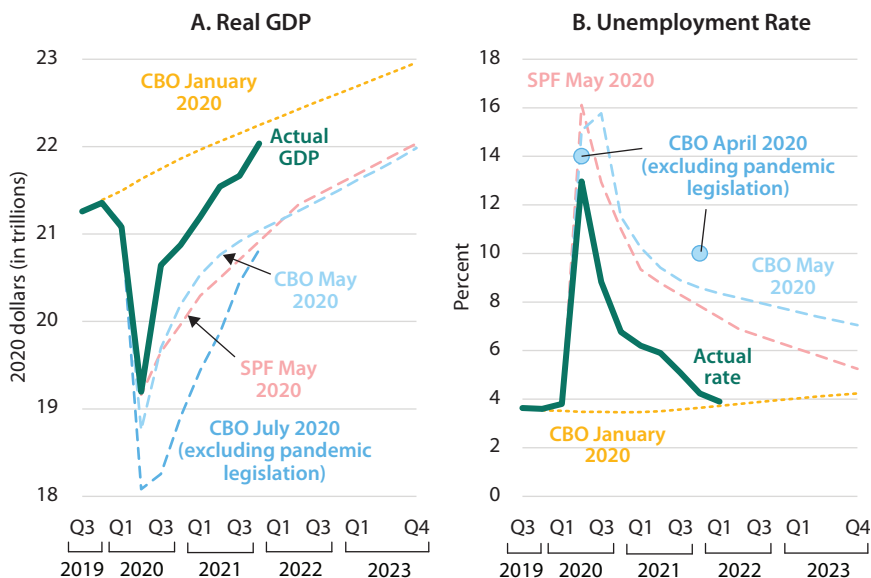
Nonetheless, although those analyses cited substantial uncertainty, their baseline estimates assumed a more rapid expansion in the supply of goods and services that were being demanded than came to pass. As outlined below, very strong consumer demand was concentrated in the goods sector, which could not keep pace. Costs of inputs went up, exacerbated by pandemic-related supply constraints and weakness in labor supply. The result has been higher inflation than the United States has seen in decades; inflation is expected to remain higher than before the pandemic at least through 2022.

Output and Employment Beat Early Expectations—Even Factoring in the Policy Response

Even after the initial substantial fiscal assistance, observers generally expected a much slower economic recovery from the second-quarter trough than actually came to pass. This is evident in Figure 1.8a, comparing the path of actual GDP to projections early in the pandemic from CBO and the Survey of Professional

FIGURE 1.8

Real Gross Domestic Product (GDP) and Unemployment, Actual and 2020 Projections



Source: Bureau of Economic Analysis n.d.a, Bureau of Labor Statistics 2022b; Congressional Budget Office (CBO) 2020a, 2020e, 2020f, and 2020h; Federal Reserve Bank of Philadelphia 2020.

Note: Actual GDP is as reported through the fourth quarter of 2021.

Actual unemployment rate is the quarterly average of monthly rates from 2019-2021, while the first quarter of 2022 is estimated using the average of January and February .reported rates. SPF May 2020 is the release date of the second quarter Survey of Professional Forecasters (SPF) report by the Federal Reserve Bank of Philadelphia. Dates listed refer to forecast publication months from CBO and SPF, with one exception. In September 2020, CBO published the agency's projection as of July 2020 excluding the pandemic-related legislation enacted between March and July 2020.

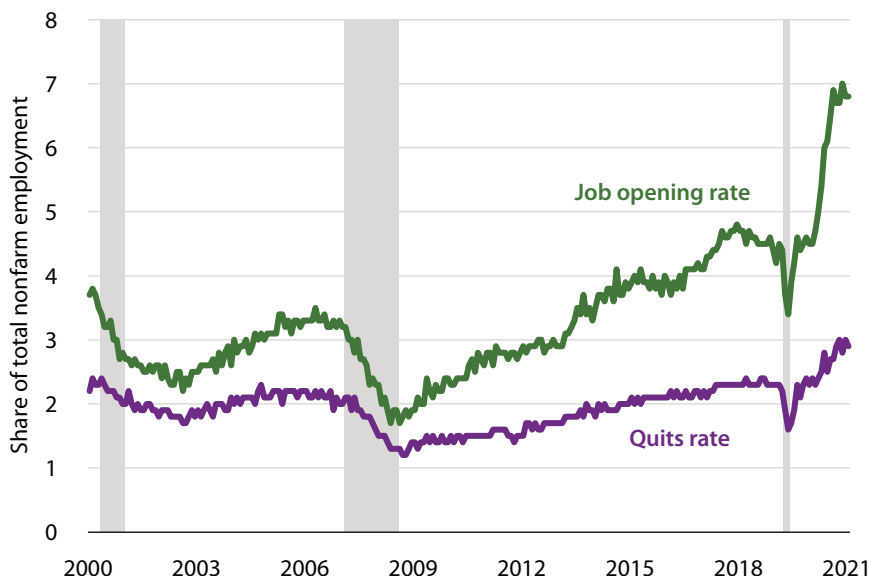


Forecasters. Real GDP rebounded strongly in the third quarter of 2020, recovering two-thirds of the output lost in the two preceding quarters. As a result, the level of GDP was 4.8 percent above the projection that CBO published in May, which incorporated the CARES Act. Real GDP surpassed its pre-pandemic peak in mid-2021; in the fourth quarter of 2021, real GDP edged within 1 percent of CBO's pre-pandemic forecast for the quarter. Still, cumulative real GDP across 2020 and 2021 was 4 percent below CBO's pre-pandemic projection, or \$1.7 trillion (in 2020 dollars).

Similar to aggregate output, the labor market began to recover much faster than initially expected. After employment had fallen by a staggering 22.4 million

FIGURE 1.9

Monthly Job Openings and Quits as a Share of Total Employment



Source: Bureau of Labor Statistics 2021.

Note: Shaded areas indicate recessions. Rates of job openings and quits are defined as the share of total nonfarm job openings and quits relative to total nonfarm employment.



by April 2020, it had recovered almost half of that decline by December 2020. In contrast, when the unemployment rate spiked 11 percentage points at the onset of the pandemic, many observers expected it to remain high and for employment to remain significantly depressed for some time. For example, in May 2020 the Survey of Professional Forecasters projected the unemployment rate at the end of 2020 would remain elevated at 11 percent and CBO projected it to rise above 15 percent (Figure 1.8b). Instead, it fell to below 9 percent in the third quarter.² Unemployment has continued to decline, reflecting very strong labor demand among firms, as evidenced by the unprecedentedly high rate of job openings (shown in Figure 1.9).

2. Since March 2020, the BLS-reported unemployment rate has undercounted unemployed workers due to misclassification of workers on temporary layoff; BLS estimates the degree of misclassification was highest in early 2020 (4.8 percentage points in April 2020) and has dissipated over time (0.1 percentage points in December 2021) (BLS 2020, BLS 2022c).

Much of the recovery in employment has been centered in the leisure and hospitality sector. From February to April 2020 employment declines in the leisure and hospitality sector accounted for about 40 percent of the total 22 million jobs that were lost in that period. A partial recovery in that sector has fueled employment growth since early 2020. Nonetheless, employment in leisure and hospitality in February 2022 remains 9 percent below its level in February 2020.

In contrast to the surprisingly swift recovery in unemployment, the recovery in labor force participation has generally been weaker than expected. The labor force participation rate plummeted 3.2 percentage points between February 2020 and April 2020 as firms shut and people left the labor force in the face of uncertain health risks, sudden increases in care responsibilities, and the suspension of in-person schooling. Swift and dramatic expansions of UI, as well as the issuance of the first EIPs, allowed people to prioritize their and their families' health over labor market income. At the same time, the Paycheck Protection Program (PPP) may have damped the measured decline in labor force participation to the degree it was a reason that some participating firms kept workers on payrolls even in the midst of shutdowns. (See Chapter 4 for a discussion of the effects of that program on employment.) Although the participation rate recovered a bit more in May and June than CBO had projected early in the pandemic, relative to CBO's projections published in July 2020, the rate was lower than expected through the remainder of 2020 and throughout 2021 (Figure 1.10a).³

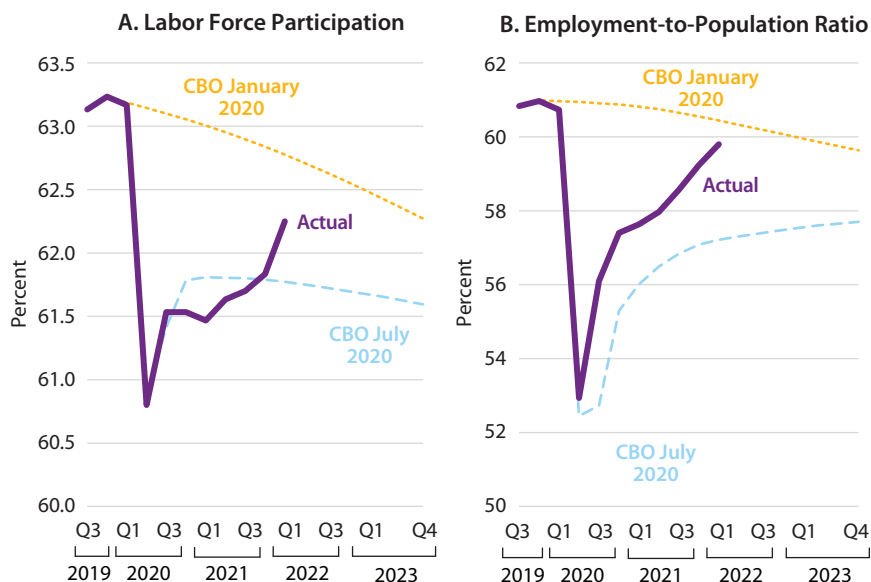
The reasons that labor force participation fell so much and has not yet recovered are not clear. Declines were similar for both prime-age workers (25–54) and older workers (55 and over), and for both men and women. No doubt, different factors mattered more or less for different groups. For example, health risks of in-person work during the pandemic have been higher for older workers than for prime-age workers. And women are more likely than men to work in the service sector, where risks are higher. At the same time, UI benefits were likely higher relative to pre-pandemic wages for younger workers with lower wages. Other advanced economies similarly affected by the pandemic have not seen anything like the same decline in labor force participation; that suggests that the U.S. policy response and preexisting U.S. institutions might have played an important though not fully understood role.

People infected with COVID-19, taking care of sick family members, or at high risk of getting sick were less likely to participate in the labor market; they might also meet the technical definition of participating but be unable

3. The increase in the published participation rate in early 2022 is almost completely due to an upward revision that affects historical data in a way that is not reflected in the published series. The published data show that the shortfall in the rate from February 2019 shrank from 1.5 percentage points in December 2021 to 1.1 percentage points by February 2022. However, analysis by economists at the Federal Reserve Bank of Atlanta (2022) suggests the upward revision should be similarly applied to 2019, such that the shortfall in participation in February 2022 from two years earlier was 1.4 percentage points.

FIGURE 1.10

Labor Force Participation and Employment-Population Ratio, Actual and 2020 Projections



Source: Bureau of Labor Statistics n.d.a; Congressional Budget Office 2020a, 2020g.

Note: Actual labor force participation rate and employment-population ratio are each quarterly averages of monthly rates from 2019–2021, while the first quarter of 2022 is estimated using the average of January and February reported rates. Dates listed refer to projections from the CBO released in each specified month.

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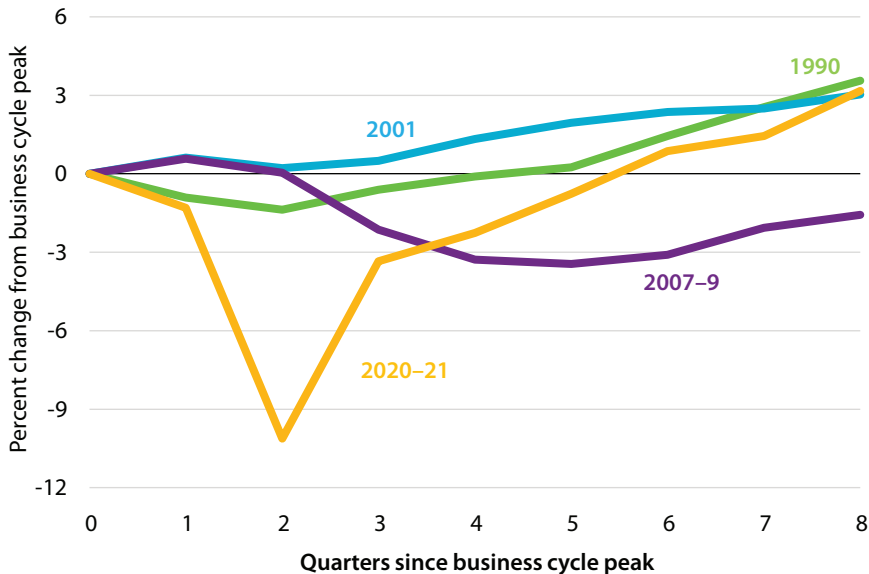
or unwilling to work at a given time. The effect of the pandemic on labor force participation was particularly large in the first half of January 2022. According to the Household Pulse Survey, during the Omicron wave in early 2022, the number of people who said they were unemployed because they were sick or caring for someone who was sick was double the previous peak in September 2021 during the Delta wave (U.S. Census Bureau n.d.).

Despite considerable focus on the challenges being faced by women who are caregivers of children and other family members in the wake of widespread closures of child-care facilities and continued school disruptions, labor force participation among prime-age women has continued to recover. In contrast, men's participation began stagnating in the summer of 2021.

We find ourselves revisiting some of the same discussions about the decline in men's labor force participation in the five years after the Great Recession. One factor present now but not in the aftermath of the Great Recession is the

FIGURE 1.11

Percent Change in Real GDP from Business Cycle Peaks, 1990–2021



Source: Bureau of Economic Analysis n.d.a; National Bureau of Economic Research n.d.; authors' calculations.

Note: The figure shows the quarterly percent change in Real Gross Domestic Product (GDP) from the peak of a business cycle, as determined by the National Bureau of Economic Research Business Cycle Dating Committee.

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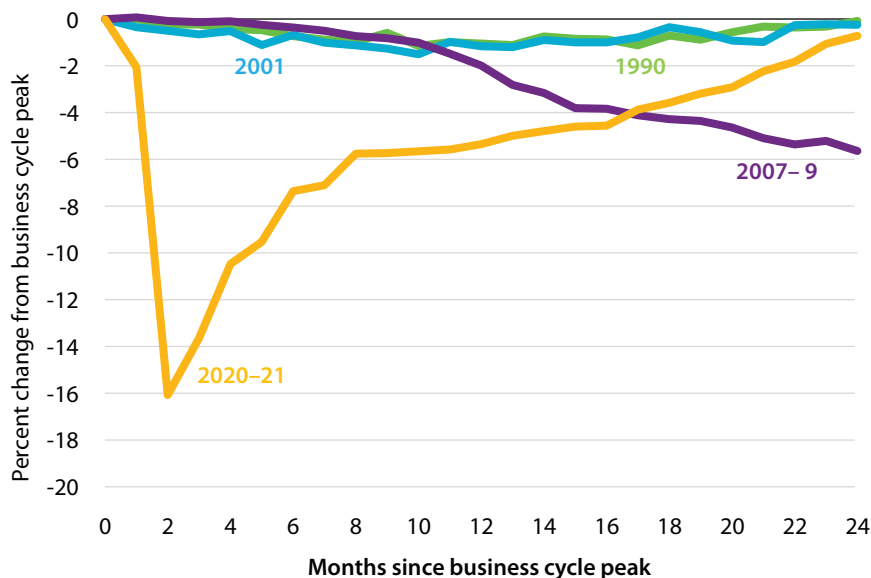
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substantial wealth built up by those with real estate and stock market assets and the savings out of income that many people have accumulated as a result of the significant fiscal support. For anyone less inclined to work, particularly in the midst of the difficulties created by the pandemic, those financial resources helped buffer the absence of labor market income. Worryingly, the longer people remain out of the labor force, the less likely it is that they will regain stable employment.

Taking together the developments in labor force participation and the unemployment rate, the recovery in the employment-to-population ratio has been incomplete. For prime-age workers, that ratio was about 1½ percentage points below its pre-pandemic value, despite the unemployment rate being only 0.3 percentage points higher. The incomplete recovery in employment against the backdrop of the very high rate of job openings (and high rates of quits among workers who appear to be looking for new employment opportunities) has meant significant wage pressure, which is discussed below.

FIGURE 1.12

Percent Change in Total Employment from Business Cycle Peaks, 1990–2022



Source: Bureau of Labor Statistics 2022b; National Bureau of Economic Research n.d.; authors' calculations.

Note: Figure shows the percent change in total nonfarm employment from the peak of each business cycle.

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Output and Employment Have Recovered Much Faster than after the 2008 Recession

Real GDP and employment have rebounded more quickly than after the 2008 recession. Even after the very sharp 9 percent decline in output early in 2020, real GDP recovered to its prerecession peak after just six quarters (Figure 1.11). In contrast, in the Great Recession, real GDP did not recover to its precrisis level until 10 quarters after the initial downturn, even though the decline from the peak was slower and only about 3½ percent in total. Those different paths partly reflect the different natures of the recessions, one being caused by a pandemic and the other by a financial crisis. In addition, as shown in Figure 1.2, the fiscal response was very different after the two recessions.

Similarly, the recovery in overall employment, roughly two years after the onset of the recession, has been much faster than after the 2008 recession (Figure 1.12). As of February 2022, employment is roughly 1 percent below its

pre-pandemic level. In contrast, two years after the 2008 recession, employment was about 5½ percent below its pre-recession level; it took several more years to fully recover.

In contrast to previous recessions, the COVID-19 recession has been worse for the service sector than the goods sector. Consider the average outcomes across the three recessions from 1990 to 2019, 24 months after each recession began: employment in the service sector was 2 percent below its pre-recession peak and employment in the goods sector was 12 percent below its peak. In contrast, as of January 2022 employment in the service sector was still 1 percent below its February 2020 level and employment in the goods sector was just 1 percent below. Because women are disproportionately employed in the service sector, they saw disproportionately large swings in their employment.

Inflation and Real Wages

Despite the enormous monetary and fiscal support, the United States experienced unusually low inflation in 2020 because the pandemic reduced demand even more than it limited supply (Figure 1.13). Some catch-up inflation to return to its trend was widely expected as the economy normalized in 2021 but, surprising many forecasters, inflation rapidly surpassed its pre-COVID-19 trend; over the course of the year, inflation both broadened to a wider range of goods and services and increased somewhat in pace. As of this writing, forecasters are increasingly expecting high inflation to persist in 2022 (with inflationary pressures exacerbated by the increase in energy and other commodity prices in the wake of the invasion of Ukraine).

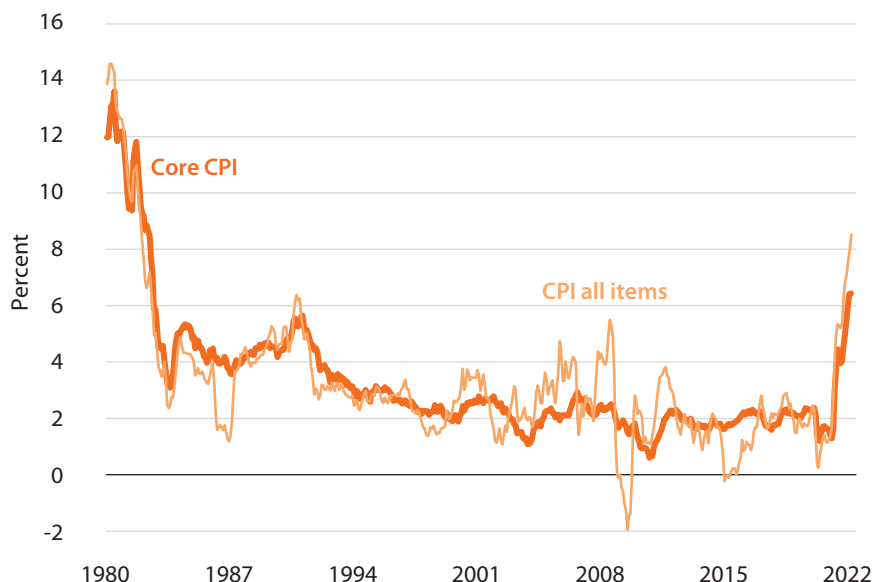
Overall, the surge in inflation in 2021 appeared to reflect both enormous pent-up demand from forgone consumer spending the previous year and significant financial resources to support that demand. At the outset of 2021, those resources reflected above-trend disposable income, accumulated savings from below-trend spending in 2020, rising asset prices, and historically low interest rates. Households then received significant additional fiscal support that further improved their finances.

Household spending far outstripped production and the ability to import, with the difference manifesting itself as inflation. The shortfall in supply was exacerbated by the shift in the pattern of consumption and constraints on production and supply chains. Inflation in the core goods sector (meaning goods excluding food and energy) as measured by CPI was 11.7 percent through March 2022, the highest pace since 1975 (with the exception of last month; Figure 1.14). Over the course of 2021, service inflation picked up, especially for housing; the pandemic led to increased demand for single-family homes probably because people spending more time at home desired more space.

A shift of consumption from services to goods likely played a role in exacerbating inflation. In the months following the onset of the pandemic, goods

FIGURE 1.13

Year-Over-Year Inflation, Consumer Price Index (CPI) Measures, 1980–February 2022



Source: Bureau of Labor Statistics 2022a; authors' calculations.

Note: Core CPI excludes food and energy prices.

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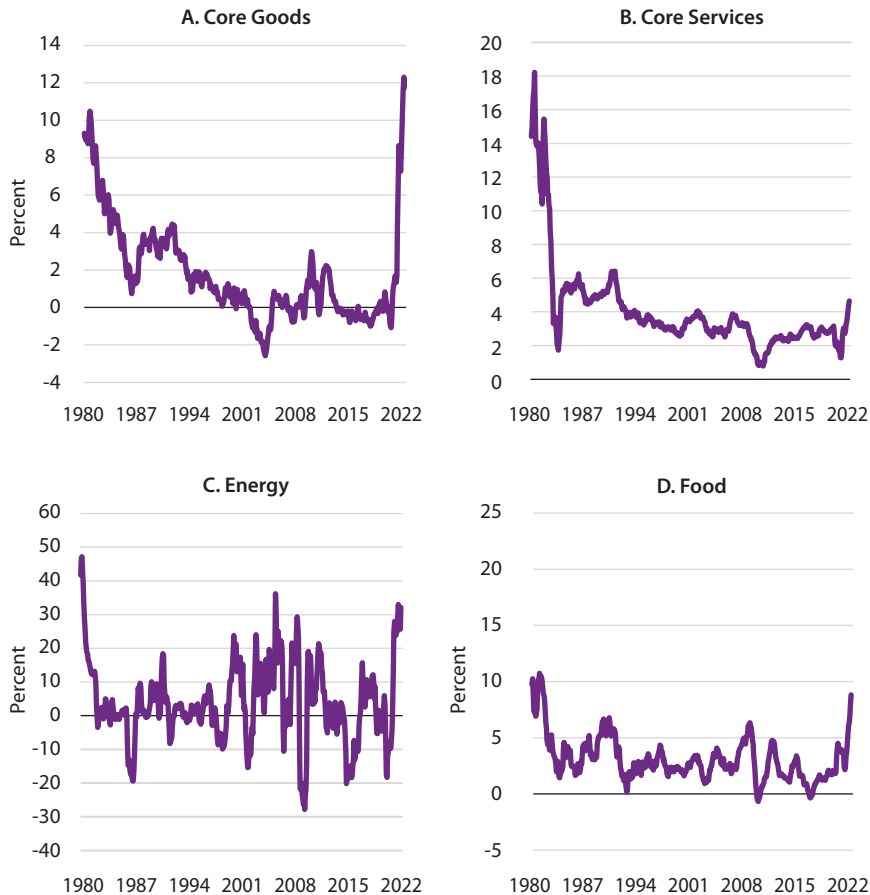
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spending rose above trend while services spending remained well below trend. Goods spending then grew rapidly following the fiscal support in the beginning of 2021, reaching new highs in the spring of 2021 even as COVID-19 cases and deaths were dropping rapidly. To the degree that goods demand reached such heights that producers and importers had little ability to further increase supply beyond an already stretched level, and to the degree that services producers were reluctant to lower prices in the face of weak demand, this shift in consumption patterns raised inflation. Note that, while it is likely that inflation would have been lower absent this consumption shift, at least some of the lower inflation in goods would have been offset by additional services inflation.

Pandemic-related supply chain constraints also played a role in exacerbating inflation, but the extent of that effect is uncertain. For example, some ports have had to temporarily curtail activity because of the pandemic, but ports in 2021 were processing more imports than ever before. In addition, the supply of microprocessor chips has not kept up with demand, but microprocessor

FIGURE 1.14

Year-Over-Year Inflation, Consumer Price Index (CPI), by Type, 1980–February 2022



Source: Bureau of Labor Statistics 2022a; authors' calculations.

Note: Core Goods refers to CPI: Commodities less Food and Energy Commodities, while Core Services refers to CPI: Services less Energy Services.



production was higher in 2021 than it was in 2019. The increase in nominal spending by U.S. households, which was largely on par with what one would have expected given macroeconomic policies and household financial conditions, resulted in a persistent surge in demand for goods. Many supply chain problems probably reflected suppliers straining but being unable to keep up. Inflation was effectively the wedge between consumers' desire and willingness

to greatly increase their spending on goods and the limits on what the economy could produce. Even if the pandemic had not disrupted supply chains in the goods sector (for example through port closures), inflation probably still would have jumped. Nevertheless, both rebuilding the economy from the stresses of 2020 and the new waves of the pandemic in 2021 created challenges for supply chains. And, new waves point to continued problems in 2022.

The increase in consumer spending sharply increased the demand for labor. Because that increase has outpaced the recovery of labor supply, many firms have raised wages to entice workers back to the labor market. Before the expansion of UI benefits ended in the summer of 2021, many workers were getting as much or more from UI than they were from their previous jobs and that affected some workers' incentives to take job offers at their previous wages (see Chapter 2). Some demographic groups have responded to the increase in wages by increasing labor supply. For example, labor force participation has been remarkably strong among young adults (16–24 years old), for whom paid work looked relatively attractive compared to being enrolled in school during the pandemic. However, as discussed above, labor force participation is still depressed overall, particularly for prime-age men.

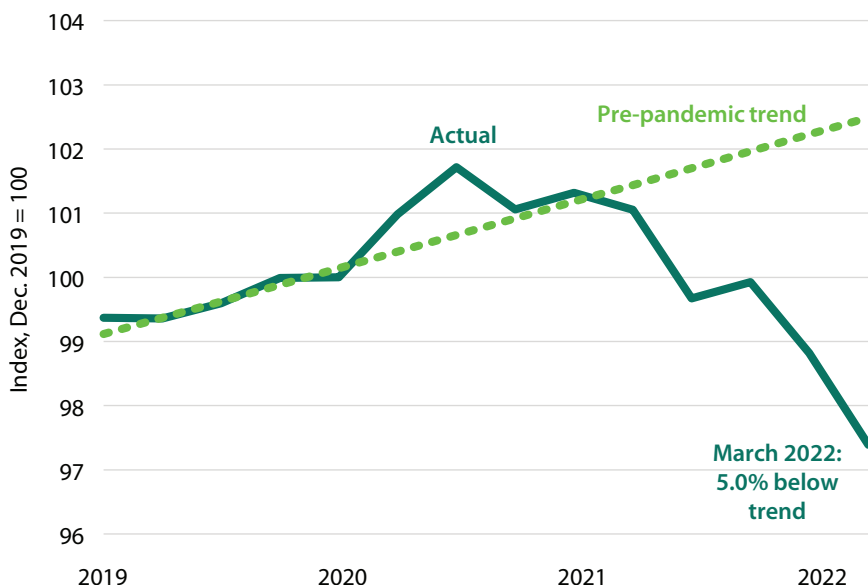
Initially, the increase in wages outpaced the increase in prices and real wages rose (Figure 1.15). Since mid-2021, however, real wages have been below their pre-pandemic level. Indeed, real wages are even further below where they would be if they continued along their pre-pandemic trend, with a shortfall of 5.0 percent relative to trend in March 2022.

The strong labor market has led to particularly strong real wage growth for workers in low-wage industries that were disproportionately affected by the pandemic. As a result, workers in the leisure and hospitality sector and the retail sector have seen real wage gains. Even so, those gains have been smaller than in the two years prior to the pandemic (Figure 1.16). For example, workers in the leisure and hospitality sector saw real wage gains of roughly one-and-a-half percent a year on average in 2020 and 2021, below the 2 percent pace in 2018 and 2019. At the same time, higher-wage sectors generally saw declines in their average real wage.

The big question going forward is what will happen to inflation and real wages. If the burst of inflation and decline in real wages lasts only two or three years, then history may evaluate it as a reasonable price to have paid for a more rapid recovery. Most professional forecasters expect this to be the case, citing anchored long-run inflation expectations as well as an easing of supply-chain constraints and a shift of spending from goods to services (Federal Reserve Bank of Philadelphia 2022; Reifschneider and Wilcox 2022). On the other hand, it is a distinct possibility that the high level of inflation could persist and be very painful to tackle. After all, short-run inflation expectations are higher, wage increases are leading firms to raise prices, price increases are leading workers to demand wage increases, the unemployment rate is already relatively low, and the Fed expects to take at least a year to move interest rates from an expansionary

FIGURE 1.15

Real Employment Cost Index, Wages and Salaries for All Civilian Workers



Source: Bureau of Labor Statistics n.d.b; authors' calculations.

Note: Pre-pandemic trend based on log-linear regression for March 2018 to December 2019. Deflated by Consumer Price Index for all urban consumers.



setting to a fully neutral setting (Blanchard 2022; Furman 2022). This chapter of the recovery from the COVID-induced recession has not finished.

Consumer Spending

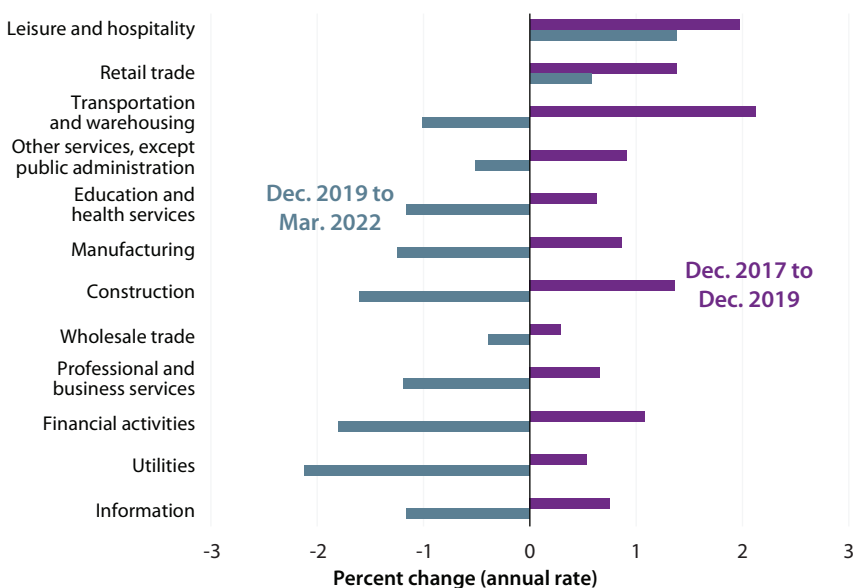
Overall, the recovery in aggregate consumer spending was extraordinarily swift (Figure 1.17a). After falling a stunning 18 percent from February to April 2020, real consumer spending had rebounded almost 15 percent by June. Moreover, real spending recovered to its pre-pandemic level less than one year after the start of the recession, a much faster recovery than occurred after the Great Recession.

Because the pandemic depressed demand for face-to-face services, such as those in healthcare, and in leisure and hospitality, the composition of consumer demand has been unusually concentrated in goods (Figure 1.17b). Real goods spending was more than 15 percent higher in January 2022 than pre-pandemic, and there were a couple of months in 2021 when it was 20 percent higher. At

FIGURE 1.16

Real Private Employment Cost Index Wage Growth by Industry

Ranked by Dec. 2019 Average Hourly Earnings with Information Being the Highest



Source: Bureau of Labor Statistics n.d.b; authors' calculations.

Note: Employment Cost Index wages and salaries for private industries deflated by Consumer Price Index for all urban consumers.

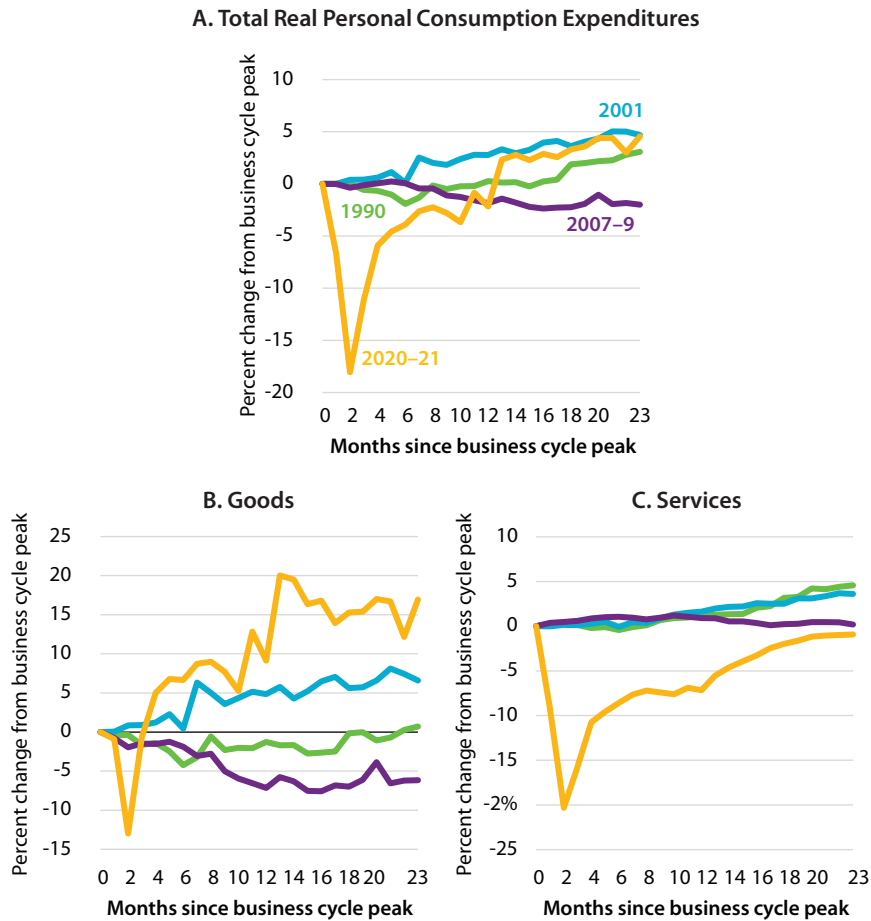


the same time, real services spending has not yet recovered to its pre-pandemic level (Figure 1.17c). In contrast, in most other recessions spending on durable goods has remained subdued for an extended period. In addition, spending on services in most other recessions plateaued in the first year of recovery before resuming growth, and services did not fall below its pre-recession level for any sustained period.

The patterns in consumer spending closely mirror the patterns in inflation. In line with very strong demand in the goods sector, goods inflation has been far higher over the past year than it was in the decades since the early 1980s. As demand for services has slowly recovered, services inflation has come up but remains within the range of U.S. experience in recent decades. As demand pivots from consumer goods to services that are more labor intensive, the

FIGURE 1.17

Percent Change in Real Personal Consumption Expenditures from Business Cycle Peaks, 1990–2022



Source: Bureau of Economic Analysis 2022; National Bureau of Economic Research n.d.; authors' calculations.

Note: The figures show the monthly percent change from the peak of a business cycle, as determined by the National Bureau of Economic Research Business Cycle Dating Committee.

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question remains as to whether labor supply will be sufficient to expand services quickly enough to meet that growing demand. If it does not, wage pressure in the services sector will likely be strong and will lead to greater inflationary pressure in that sector—even as goods demand and goods prices wane.

Households in aggregate have had significant resources to finance consumer spending, initially because of the extraordinary income support provided by the federal government and later from the rebound in labor-market income, as well as a significant run-up in stock and house prices. As detailed in Chapters 2 and 3, a burgeoning literature shows that fiscal support was an important source of financing of the recovery in consumer spending. Indeed, spending patterns show that recipients of expanded UI benefits increased their spending on average in the spring and early summer of 2020 relative to pre-pandemic levels, whereas those who remained employed generally maintained their spending.

Although the initial burst of fiscal support in March 2020 was essential to the early economic recovery, the timing of fiscal support after that did not correlate well with the financial needs of households. For example, in the spring of 2020 unemployed people began receiving an extra \$600 a week in supplemental payments, resulting in most recipients receiving more in total UI benefits than their prior compensation. (The median replacement rate was 145 percent; see Chapter 2.) But those supplements expired at the end of July 2020; in their place a small portion of unemployed people were able to collect weekly supplements of between \$300 and \$400. This abrupt change in policy occurred when the rate at which employers were laying off workers was still elevated, the number of people applying for initial UI claims was still elevated, and the employment-to-population ratio was still well below its pre-pandemic level (Figure 1.18). As a result of these gyrations in policy, the total amount of weekly supplements to unemployed people fell from \$75 billion to roughly \$20 billion in the course of a month, and then declined to near zero by the end of 2020.

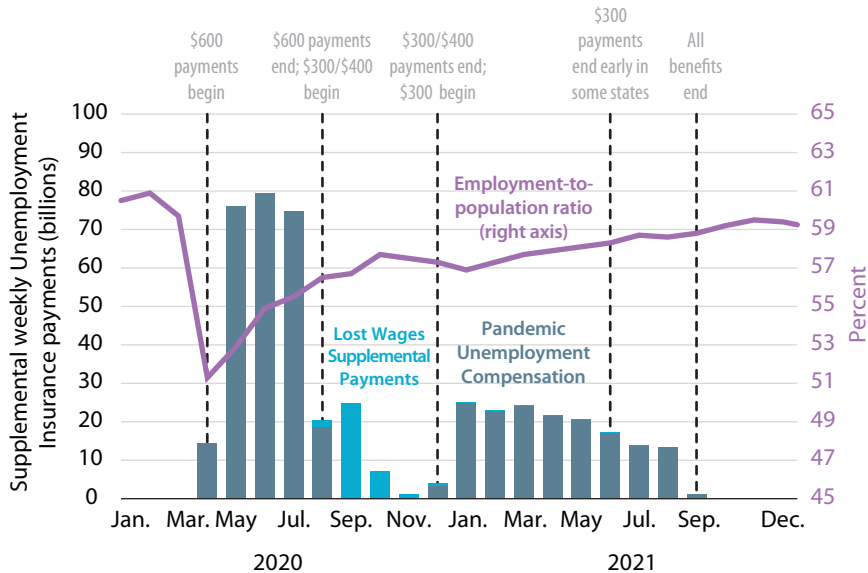
Legislation at the end of 2020 reinstated a weekly supplement at a rate of \$300, which provided much-needed fiscal support to the unemployed. But there, too, the timing of that support had little to do with the recovery of the labor market. Between June and September 2021 some states curtailed benefits early, and then in September the weekly supplements and other enhanced UI benefits sunset nationwide. At the same time, the rate of job openings peaked in July in the South, the Northeast, and the West before falling modestly for two months as the surging Delta variant increased the health risks of in-person services and employment. Consistent with the large swings in fiscal support to households over the past two years, consumer spending recovered quickly, though just partially, through the early fall of 2020, and then languished some until early 2021.

International Comparison

Overall, the United States has had a more successful GDP recovery, but a less successful employment and inflation outcome, than other advanced economies. This combination meant that the United States produced its comparatively higher level of GDP with comparatively higher hours and productivity. The

FIGURE 1.18

Supplemental Unemployment Benefits During COVID-19



Source: Bureau of Economic Analysis n.d.b; Bureau of Labor Statistics n.d.a.

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Note: Congress enacted Pandemic Unemployment Compensation payments (PUC) of \$600 per week from March 28, 2020 to July 31, 2020. A PUC payment of \$300 was put in place from December 26, 2020 to September 6, 2021, when all enhanced Unemployment Insurance policies (including Pandemic Unemployment Assistance, Pandemic Emergency Unemployment Compensation, and Mixed Earners Unemployment Compensation) expired. Starting in June 2021, some states began ending PUC early. Also between August 1, 2020 and December 27, 2020, President Trump authorized states to apply to provide Lost Wages Supplemental Payments, expending up to \$44 billion from the Disaster Relief Fund. Payments could be \$300 or \$400 per week depending on state policy.

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different economic trajectories are the result of different economic policies, preexisting institutions, and governmental and societal responses to COVID-19. The United States had a less sharp initial downturn in its GDP than occurred in the euro area and in most other advanced economies apart from the Asia-Pacific region, which was less affected by COVID-19. The economies with deeper downturns in the first half of 2020 also generally had more rapid partial bounce-backs in GDP in the second half of 2020, but remained behind the United States in terms of the level of economic output at the end of 2020 relative to the pre-pandemic peak.

The overall economic outcomes of the different countries can be shown by comparing GDP in the fourth quarter of 2021 to either the Organisation of Economic Co-Operation and Development's (OECD) last forecasts made before the pandemic, the trend prior to the pandemic, or the level of real GDP in the fourth quarter of 2019 (Figure 1.19). All three comparisons tell a similar story: the United States is not fully back to where it was expected to be before the pandemic, but it is much closer than any of the other Group of Seven (G7) economies and the euro area as a whole. In addition, several smaller economies performed better than the United States.

The United States' faster GDP recovery is likely attributable to three differences from other economies: a comparatively looser set of social distancing rules, a population that appears more willing to engage in activity even in the face of COVID-19, and a larger fiscal response, especially in 2021. European countries, for example, had much more extensive lockdowns that barred even socializing with friends outdoors or virtually any activity other than essential trips, steps that were never taken in the United States. This was a main reason why the initial decline in GDP was so much larger in Europe. After initial lockdowns and other major restrictions put in place in early 2020 were eased in the summer, they were reinstated toward the end of 2020 and ultimately lasted much longer than they did in the United States. At the same time, the pace of vaccination was initially much slower in Europe. Many of these differences can be seen in the comparison of spending on services shown in Figure 1.20, with the initial gap that widened in the face of increased lockdowns in Europe but then narrowed as COVID-19 policies and behavior converged between the United States and Europe.

There are no apples-to-apples comparisons of the magnitude of fiscal stimulus in different countries. Some published measures tell very different stories, and the actual deficit numbers are also distorted by reporting and accounting differences. One clean way to estimate differences in one critical aspect of the initial fiscal stimulus is to compare the increase in social benefits to households across countries, as shown in Figure 1.21. The United States is a large outlier with a much larger increase in social benefits in 2020. Moreover (and not shown), the United States expanded the level of social benefits still further in 2021. Although comparable data for 2021 are scarce, it appears that social benefits decreased in other countries. This is consistent with data on disposable personal income that show a large increase in the United States, while it appears that income stayed only on trend in major economies like France, Germany, and the United Kingdom. The United States also appears to have had larger stimulus in other respects; for example, the PPP program is much larger than anything we are aware of in other countries.

The comparative story of the employment trajectory is almost the exact opposite of GDP. The United States had a larger decline in employment than most of the advanced economies and a faster partial bounce-back in employment; the decline remains larger than all the other major advanced economies

FIGURE 1.19

Real Gross Domestic Product (GDP) in 2021Q4 vs Pre-pandemic Forecast, Level and Trend in the United States and Advanced OECD Economies



Source: Organisation for Economic Co-operation and Development (OECD) 2019 and 2022b; authors' calculations.

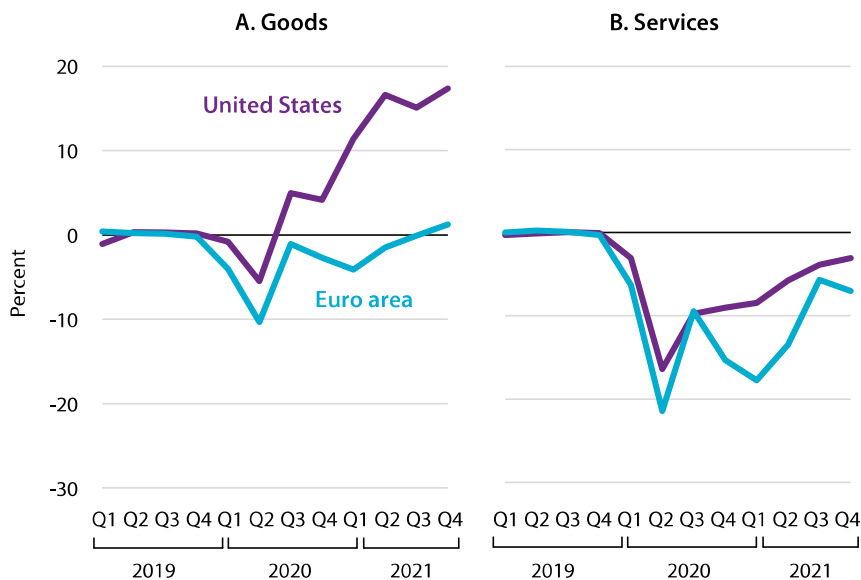


Note: Pre-pandemic trend is based on log-linear regression of values from 2018Q1 to 2019Q4. Pre-pandemic level is value in 2019Q4. Pre-pandemic forecast is from November 2019 OECD Economic Outlook. EA is the euro area average. Ireland is excluded due to differences in the treatment of foreign-owned multinational enterprises in GDP calculations.

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FIGURE 1.20

Difference in Consumption Relative to Recent Trends in United States and Euro Area, 2019Q1–2021Q3



Source: Eurostat 2022b; Bureau of Economic Analysis 2022; authors' calculations.

Note: Euro area calculated for countries with available data (Austria, Estonia, Finland, France, Germany, Ireland, Italy, Latvia, Luxembourg, Malta, Netherlands). Differences are calculated relative to pre-pandemic log-linear trend from 2018Q1 to 2019Q4.

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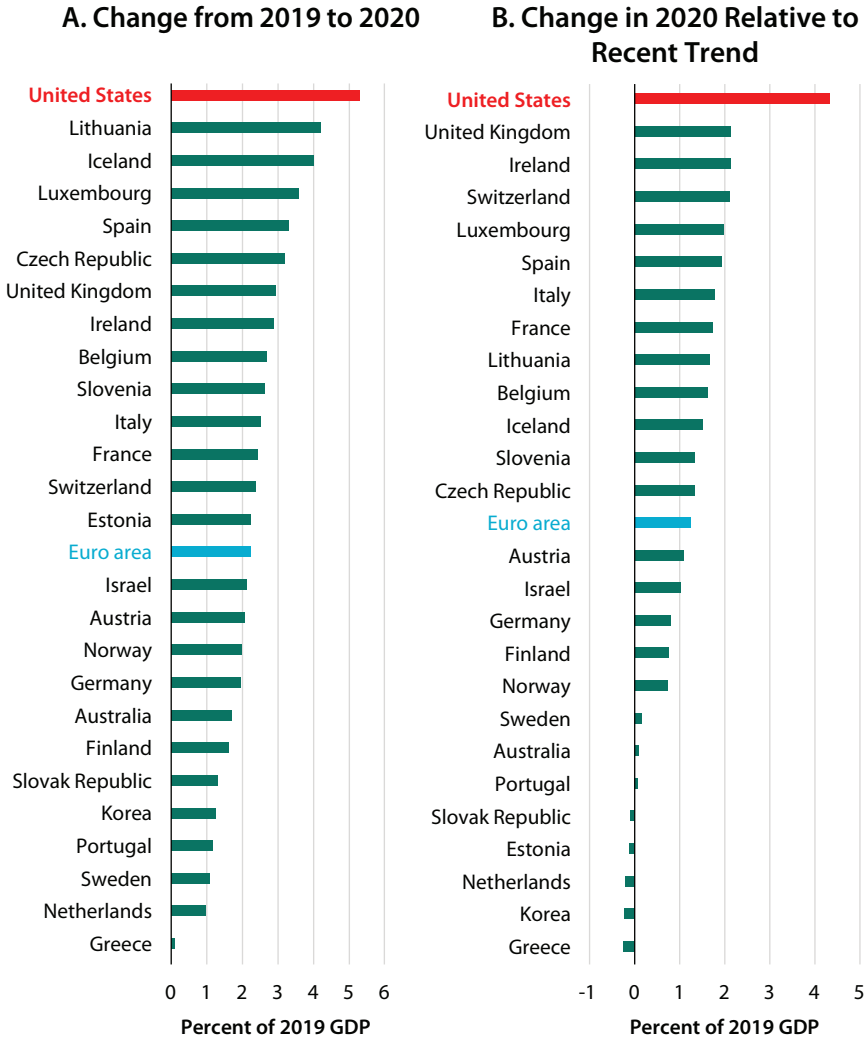
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(as shown in Figure 1.22). Overall, the employment rate in the United States was down 2.4 percentage points in 2021 Q4 relative to its pre-pandemic rate as compared to the roughly unchanged employment rate for the median OECD advanced economy.

There is no definitive explanation for the comparative performance of employment. Part of the difference between the U.S. and other countries, especially in 2020 and the first half of 2021, is definitional. In the U.S. furloughed workers were generally not counted as employed while in many other countries they continued their formal employment with their wages at least partially paid by the government. Nevertheless there were also real economic disparities. Those are unlikely to reflect different trends in COVID-19 or vaccinations because employment was stronger in other countries even when they

FIGURE 1.21

Change in Social Benefits to Households, Advanced OECD Countries



Source: Organisation for Economic Co-operation and Development 2021; authors' calculations.

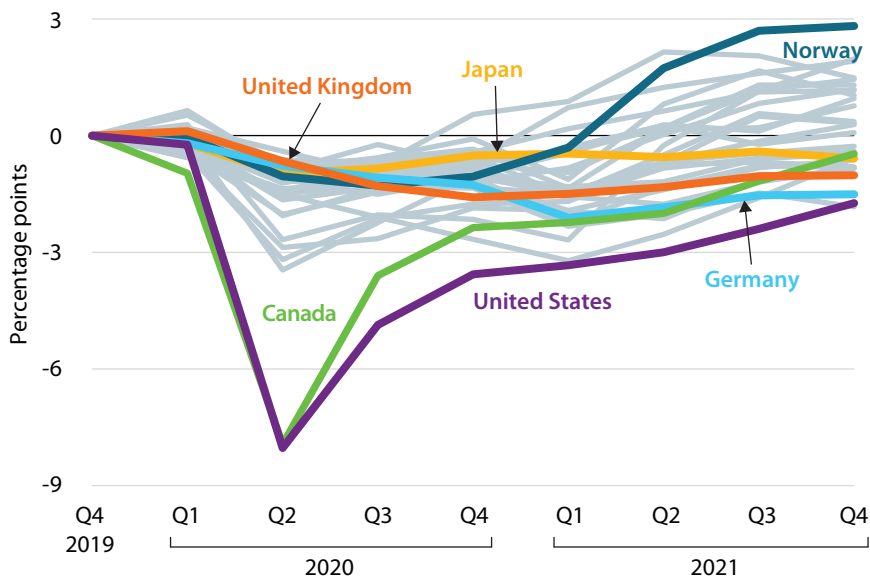
Note: Social benefits to households include cash and in-kind transfers primarily by government (but also by non-profit institutions) to meet financial needs in case of unexpected events, such as sickness, or unemployment. Trend social benefits for 2020 based on average growth rate for 2018 and 2019.



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FIGURE 1.22

Change in Employment–Population Ratio, Advanced OECD Countries, 2019Q4–2021Q4



Source: Organisation for Economic Co-operation and Development (OECD) 2022a; authors' calculations.

Note: Iceland has been removed due to an apparent trend break in the OECD data.

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had higher COVID-19 caseloads or a slower pace of vaccination. Some of the earlier differences are more definitional than economic, since people who were unable to work in Europe and in many other countries were kept on payroll and counted as employed, with the government reimbursing employers. In the United States, those same workers would have been on temporary furlough, counted as unemployed, and would have received assistance from UI. This difference, however, faded over time as employment retention programs lapsed in Europe and temporarily furloughed workers in the United States were recalled to their jobs.

It is likely that two major differences between the U.S. response and the response in other countries played an important role in the differential employment outcomes. The first is the form of support. Many other countries, especially but not only those in Europe, primarily relied on employment retention while the United States relied much more on UI. Employment retention may have

better preserved job matches (although temporary furloughs onto UI also preserved these matches in the United States). In addition, job retention gave employers more leverage to force employees to return to work, while the U.S. system gave employees more leverage to say “no” to returning to work. This interpretation is consistent with the fact that nominal wage growth has been stronger in the United States than it has been in many other major economies.

The second major difference was that the level of generosity of support in the United States was considerably higher than in other countries. This might have made a difference either through income effects (people had enough money that they did not need to return to work) or substitution effects (it was more costly to return to work). (See Chapter 2 for a discussion of the evidence on how benefits in the U.S. affected employment.) The United States was one of the few major economies to provide nearly universal cash support. Moreover, European systems often replaced around 70-90 percent of wages as compared to more than 100 percent in the United States for the majority of workers from March 2020 through late July 2020 and for many workers from January 2021 through early September 2021.

One consequence of the larger fiscal support, faster GDP recovery, but slower jobs recovery in the United States has been considerably higher inflation than in most other countries. For example, the United States and Europe were both hit by many of the same supply shocks. Some were worse in the United States (e.g., the increase in the price of used cars) and others were worse in Europe (e.g., the increase in the price of natural gas). Nevertheless, inflation over the past two years has been running at about a two-percentage-point faster annual rate in the United States—or 4 percent cumulative. This is shown in Figure 1.23, which uses comparable inflation measures for the two economies.

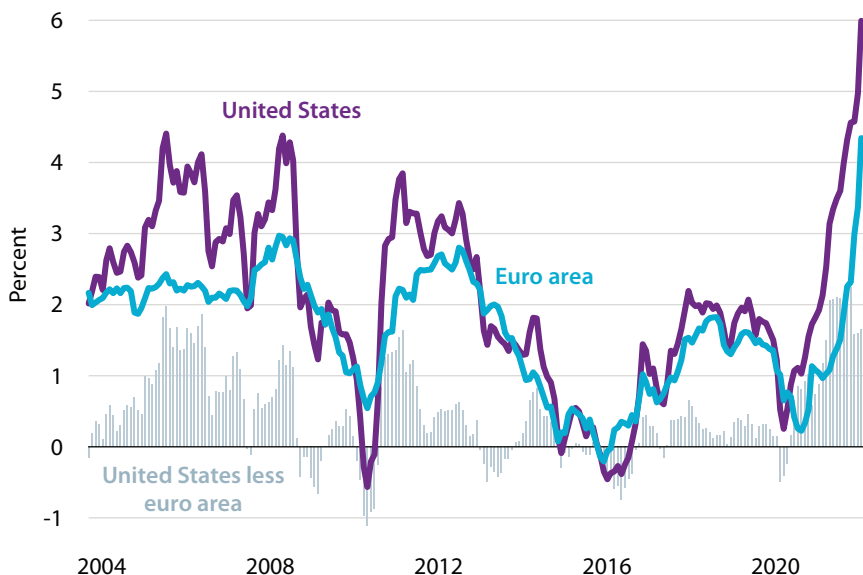
Lessons Learned

The COVID-19 economic crisis and the economic policy response are still unfinished. As of this writing, the shortfall of workers in the labor force is roughly two million, prices are rising at the fastest rate in 40 years, and real wages are falling at the fastest rate in decades (Furman and Powell 2022). How these challenges are handled and how they affect the economy over the coming years will be an integral part of how the overall policy response to COVID-19 is evaluated. Also, although a flood of rapid research already has evaluated different aspects of the policy response—and the authors of this volume have tried to synthesize and advance what is known—many pandemic-era programs have still not been evaluated and our understanding of others could change with further research.

Nevertheless, it is not too soon to draw some broad lessons from the COVID-19 recession experience. In many ways, some of the lessons from the Great Recession were helpful in ensuring that some mistakes were not repeated. One reason policymakers went so big this time around was a widespread

FIGURE 1.23

Consumer Price Inflation in the United States and Euro Area, 24-Month Annualized Percent Change



Source: Eurostat 2022a; Bureau of Labor Statistics 2022a; authors' calculations.



Note: Data reflect harmonized indices of consumer prices for comparability across regions. Bars showing difference between United States and Euro Area inflation rates are in percentage points.



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perception that the previous fiscal policy response was too small. Similarly, state and local budget cutbacks undermined the overall response in the wake of the Great Recession, but a much higher level of aid in the COVID-19 crisis ensured that this problem did not repeat. In other ways those lessons were misapplied because a natural-disaster-like crisis is very different from a financial crisis. Moreover, in many cases policies lurched from too small to too large, leading to excessive inflation and setting unfortunate or inappropriate precedents for how to deal with future economic setbacks. Finally, the response to the COVID-19 crisis was truly impressive when done so quickly and in such difficult conditions; nevertheless, policymakers should use the time before the next crisis to prepare better so that less improvisation is needed.

We propose six lessons that policymakers can draw on in planning for any crises to come. These lessons are based on the experience to date, all of which

generalize beyond pandemic policy responses to other types of recessions or even to normal times. The reason to point to lessons learned is not to apportion blame for decisions made under extremely difficult circumstances, but instead to offer a framework for building a better response for future recessions.

Lesson 1: A Vigorous Fiscal Response Can Buffer Most Households from the Effects of an Economic Downturn

The fiscal support enacted in 2020 and 2021 boosted income for most households and disproportionately for lower-income households, resulting in a large reduction in poverty rates even as real GDP was diminished. Future recessions will invariably cause some pain, with economic downturns disproportionately hurting the most vulnerable, but policymakers should appreciate that quick and decisive action to bolster the safety net can mitigate much of that pain.

Automatic stabilizers already help to buffer the effects of economic downturns. For example, households with reduced incomes pay less in taxes and in some cases become eligible for government benefits such as nutrition assistance through SNAP; in addition, if workers lose their jobs, they could become eligible for UI. This preexisting social safety net is, however, inadequate in the face of recessions: it is not generous enough and has too many gaps, which is why it needed to be supplemented by policy action both in the Great Recession and to a much greater degree in the COVID-19 recession. Additional automatic stabilizers are likely part of the answer, as discussed in lesson 4 below, but are unlikely to be sufficient to avoid the need for well-timed and wise discretionary fiscal responses in the future.

This lesson also applies when the economy is doing well. Idiosyncratic shocks to family incomes or persistent inequality could be better insured by the fiscal system. The experience of 2020 and 2021 shows that fiscal policy can significantly lower poverty in bad times; this lesson also applies to better times.

Lesson 2: A Vigorous Fiscal and Monetary Response Can Speed Economic Recovery

The economic recovery was much faster than in past recessions, and the GDP recovery in the United States was much faster than it was in other large economies. The precise degree to which this is the result of the way the United States experienced the pandemic or the result of the policy response is unknown. Likely it is a combination of the two. In the end, the business sector and the household sector have remained remarkably strong, and real GDP is nearly back to the path that was projected before the pandemic.

The initial, robust response by monetary policymakers was critical to keeping the financial sector on an even keel. It is important to draw lessons

not just from what happened, but also from what did not happen: for example, there was no financial crisis in the United States or worldwide. Initially, equity markets plummeted, and interest rates soared even on very safe securities. Vigorous actions by the Fed to cut interest rates were not enough; it needed to and quickly did make much more liquidity available, targeted both to individual markets and to the financial system as a whole. This worked, and the economic experience of households and businesses was better as a result. Better preparation in the form of more robust and stress-tested balance sheets for banks prior to the recession also helped.

Polymakers are unlikely to ever be able to fully predict and thus prevent recessions. Some types of recessions, like financial crises, are more likely to have longer-term deleterious consequences. But policymakers should take the lesson from the past two years that vigorous fiscal and monetary policy speeds economic recoveries.

Lesson 3: Policymakers Can Respond Too Vigorously to an Economic Downturn

A common statement in crafting policy responses is, “It is better to err on the side of too much than on the side of too little.” The statement is useful in thinking about asymmetric risks if one is thinking whether *somewhat too much* is better than *somewhat too little*, or if *significantly too much* is better than *significantly too little*. That is because policy is generally better at mitigating the negative side effects of doing too much rather than the negative side effects of doing too little. Unfortunately, the statement provides no useful guidance on how large a response should be. In the face of a downturn, should the response be \$100 billion or \$1 trillion or \$10 trillion? Moreover, sometimes observers go further and argue, “You can never do too much.” Taken literally, that is clearly wrong. Over the course of the crisis, particularly in 2021, the increase in fiscal support was too large, and it is worth exploring to what degree this was knowable at the time and to what degree this is clear only in retrospect.

Doing too much can have serious downsides that might be difficult to mitigate. Macroeconomic support for an economy deep in recession with many underused resources can increase output and employment with little effect on inflation. But as the economy gets closer to its capacity, additional macroeconomic support will feed increasingly into inflation instead of improvements in output and employment. The trade-off of increased output at the expense of inflation may become increasingly undesirable the further macroeconomic policy pushes.

Doing too much not only affects inflation but also how workers are doing and the longer-term health of the economy. As we have seen in the past year, when wages adjust less frequently than prices, a bout of surprise inflation can raise prices more than wages, making workers worse off. Moreover, the

employment gains can be more transitory than the inflation costs if expectations of higher inflation are built into pricing decisions. Ultimately, the cost of treating these side effects can be very high and may lead the recovery itself to be unsustainable, jeopardizing the very gains for employment and output that policy was designed to produce.

From a macroeconomic perspective, the timing and extent of monetary and fiscal support should be matched to the economy's ability to provide the goods and services financed by that support. From a bottom-up perspective, relief should be targeted to achieve various goals: for example, to help households avoid having to cut back their consumption in the face of temporary shocks or to help state and local governments avoid budget cutbacks. Assessing those needs in real time can be very difficult and uncertain. In 2020 such an assessment was nearly impossible. In 2021, however, the dimensions of the shortfalls in output and in household incomes were clearer, and yet no clear economic justification was offered for the overall magnitude of the response, the size of the EIPs, the magnitude of expanded UI, or the amount of state and local fiscal assistance.

Lesson 4: Fortified Automatic Stabilizers Would Help Reduce Both Errors of Doing Too Little and Errors of Doing Too Much

Much of the debate over the fiscal response to COVID-19 was about whether it was too large or too small. This debate misses the point because it frames the problem incorrectly. Much of the legislation delivered aid in specified amounts for specified periods, instead of amounts and timing that were automatically calibrated to the size of the need. For example, the CARES Act distributed a lot of dollars per month, but most of its programs had ended by the summer of 2020, so it was not sufficient to meet the continued challenges of COVID-19. The support was then too small going into the fall as Congress dithered on passing additional assistance. Similarly, the American Rescue Plan distributed a lot of dollars per month, but the assistance ended while the economy still had some challenges.

Getting the magnitudes and timing right is not a new problem. Many of the policy responses ended too soon in the wake of the Great Recession. Extended UI expired even while long-term unemployment was still high, and state and local fiscal relief ended while budgets were still strained. Monetary policy shifted from maximalist response mode when the economy was still many years away from a full recovery.

The errors made in the pandemic response were often of the opposite sign. The third round of stimulus checks went to households that were generally in better financial shape than before the pandemic. UI was greatly expanded

in January 2021, but the magnitude and breadth of the expansion remained unchanged through the summer even as the unemployment rate and COVID-19 rates fell and job openings rose rapidly.

Policy will always make errors when viewed in hindsight, but many of these errors, like the ones in the wake of the Great Recession, were evident based on the data available to policymakers at the time.

These considerations only reinforce the importance of automatic stabilizers. UI benefit generosity and duration should be a function of economic conditions. Similarly, if state and local fiscal relief were determined using an automatic stabilizer approach, relief would have been larger and more prolonged in the Great Recession and smaller and more rapidly tapering in this one. However, automatic stabilizers are only a default; policymakers might still need to bolster them—if the stabilizers do not provide enough or sufficiently targeted support—or even in some cases to turn them off more quickly.

Lesson 5: We Still Have a Lot to Learn about How to Create and Protect Jobs in the Wake of an Economic Downturn

In the global financial crisis, Germany had a similar reduction in GDP to the United States without a very large increase in unemployment. Many other countries adopted German-style job retention and job sharing (or part-time unemployment insurance) in the wake of that crisis, or improvised such systems when the COVID-19 crisis hit. Such policies may help explain why those countries experienced smaller employment losses and now have much more fully recovered employment rates.

It is still not clear what policies would work better in the United States to lessen the impact of a GDP decline on employment and preserve worker attachment to their employers. In the COVID-19 crisis, the federal government encouraged states to adopt or expand work-sharing programs that provided prorated UI benefits to workers whose hours were reduced in lieu of a layoff (i.e., short-time compensation) but these programs were little used (von Wachter 2021).

Of course, it might not be possible to better insulate the job market from recessions, or perhaps doing so could have other negative side effects, like inhibiting productivity-increasing reallocation. But, given the significant and long-lasting impact that unemployment has on workers, solving this problem is worth significantly more work by the economic policy community.

Lesson 6: Policies Need to Be Better Targeted in Future Crises—and That Will Require Improving Systems and Policies in Advance

A total of \$5 trillion was spent responding to the COVID-19 crisis. It would be impossible to spend at anything resembling this scale as a response to a crisis once every decade. Moreover, the large scale of the response contributed to substantial inflation. Just as the magnitude and timing of the response should be improved through more automatic stabilizers, the targeting of the response should be as well.

The good news is that many of the most important benefits could have been achieved at much lower cost, especially if the policies had been developed in advance of the crisis. To give a sense of magnitudes, outside of a recession, the amount of additional income necessary to pull all households out of poverty is about \$175 billion. That suggests that preventing poverty from increasing in recessions and reducing poverty in good times can be done at a comparatively modest cost. In addition, improving UI systems in advance would ensure that benefits go out quickly, and would allow benefits to be better tailored so that they can rise during downturns but not exceed prior income. Similarly, better-targeted support for businesses without access to credit markets and in danger of failing would enable business continuity at a much lower cost.

Over the past two years, achieving those goals was hard to do in the rush of events. That is why it is important that policymakers not wait until the next crisis to improve such systems. It is essential that policymakers use this time to figure out how to provide support in a manner that does not unnecessarily benefit those who are already financially secure and those with access to credit markets.

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Lessons Learned from Expanded Unemployment Insurance during COVID-19

Peter Ganong, Fiona Greig, Pascal Noel, Daniel M. Sullivan, and Joseph Vavra¹

Introduction

In response to the COVID-19 pandemic, the U.S. government implemented the largest expansion in federal unemployment insurance (UI) benefits in U.S. history: First, it increased the level of benefits through weekly supplements. Next, it expanded eligibility of UI through the Pandemic Unemployment Assistance (PUA) program to independent workers and those unable to work for a variety of COVID-related reasons. Finally, as is typical with recessions, it extended the duration of federal UI benefits, in this case by 53 weeks.²

As a result of swift and widespread job losses and these UI expansions, weekly continued UI claims increased from 2 million in February 2020 to 30 million in May and June 2020, costing close to \$120 billion per month (Figure 2.1). At its peak in the second quarter of 2020, UI represented 9 percent of employee compensation, fourfold more than ever before on record.³ Federal UI expansions expired in September 2021, with 26 states terminating them in June or July 2021. Claims did not fall below 6 million until September 2021,

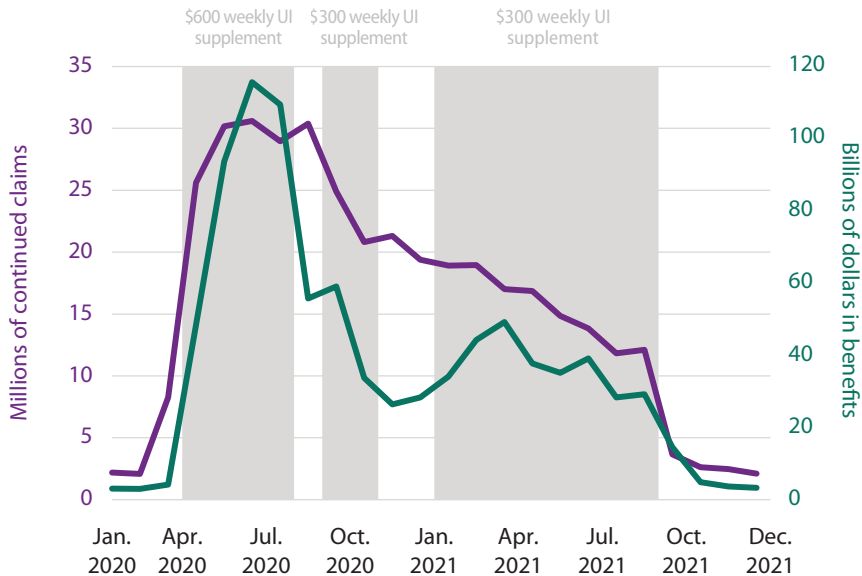
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2. For recent historical context, UI expansions during the Great Recession included extending extra weeks of benefits to up to 47 weeks from mid-2008 through 2013 through Emergency Unemployment Compensation, full federal funding of Extended Benefits, and a \$25 weekly UI supplement between February 2009 and December 2010.

3. Estimated from Bureau of Economic Analysis (BEA; 2022b) quarterly data on personal income.

FIGURE 2.1

Continuing Unemployment Insurance Claims and Cost



Source: U.S. Department of Labor n.d.a.



18 months into the pandemic. By the end of 2021, they were roughly back to pre-pandemic levels.

This chapter summarizes five key empirical findings on the role of expanded UI during the COVID-19 pandemic. First, UI policy expansions were highly progressive in that they offset income losses and delivered the most benefit to lower-income workers. Second, the spending impacts of UI were large: UI benefits provided a powerful stimulus to the macroeconomy by boosting consumption. Third, work disincentive effects from UI benefits were small during the pandemic, especially when compared to historical standards. Fourth, the PUA program was successful in increasing access to benefits and insuring income losses for workers on the margins of the labor market without clear evidence of greater work disincentive effects. Finally, administrative shortcomings and red tape in serving the surge in UI demand were costly in terms of consumer welfare and government expense.

From these empirical findings we draw two key conclusions for policy. The first conclusion is that UI benefit expansions covered labor income risk not

insured by regular UI, warranting consideration of adopting these more permanently or as automatic countercyclical stabilizers. Specifically, with a typical replacement rate of 50 percent, regular UI benefits cannot sustain families over extended periods of time; as a result, temporary supplements might be appropriate, especially during recessions when the risk of long-term unemployment is high. Although flat-dollar-amount supplements were highly progressive, flexible supplements that target a replacement rate likely create fewer inefficiencies in terms of work disincentives. Flexible supplements require a stronger IT and administrative back end, however; IT and administrative shortcomings were a critical barrier to implementing such a policy during the pandemic.

More permanently broadening eligibility for UI also warrants consideration. A key challenge that states faced during the pandemic was establishing an entirely new program amid peak claims volume. Thus, keeping a permanent version of PUA has the important benefit of allowing states time to establish protocols and enhance systems to accommodate other populations of uncovered workers during non-peak times.

The second conclusion for policy from empirical findings is that stronger administrative systems are necessary for delivering timely and accurate UI benefits at scale in a worker-centered, recession-ready way. In UI administration there is always a trade-off between speed and accuracy. Given that UI plays a key fiscal stimulus role to mitigate a recession, its ability to deliver vast sums of relief quickly is critical. And yet states faced delays in processing the enormous surge in UI claims and standing up the new PUA program. In response, many states relaxed third-party verification, which resulted in an increase in improper payments.

This trade-off between speed and accuracy does not have to exist, however. Investment in technology can expand the frontier of what is possible, enabling states to be more accurate in making payments at a given speed or to make payments faster while maintaining accuracy. States need to approach their UI delivery infrastructure as if it were economic disaster preparedness, much the same way the Federal Emergency Management Agency (FEMA) plans for aid delivery during a hurricane. As such it seems reasonable for the federal government to play a more active role in responding to labor market disasters, rather than relying on states to prepare and respond on their own. The federal government could provide technology and data infrastructure that could enable not only flexible benefit levels set at a target income replacement rate, but also stronger, more-seamless eligibility verification and fraud prevention.

Background and Data

During the pandemic, the U.S. government expanded federal UI benefits through three key programs: Federal Pandemic Unemployment Compensation, Pandemic Unemployment Assistance, and Pandemic Emergency Unemployment Compensation.

Federal Pandemic Unemployment Compensation (FPUC) established weekly supplements on top of any state UI benefits for which recipients were eligible. Weekly supplements were available intermittently, and were set at \$600 between March and July 2020, \$300 in Lost Wages Assistance (LWA) in September and October 2020, and \$300 between January 2021 and September 6, 2021.⁴

Pandemic Unemployment Assistance (PUA) expanded eligibility of UI to self-employed workers, gig workers, independent workers, and others not previously eligible for UI or who were unable to work for a variety of COVID-related reasons.⁵ For example, workers could receive UI benefits if they were unable to work because of dependent care responsibilities, a COVID-19 illness in the family, or the health risk at work.

Pandemic Emergency Unemployment Compensation (PEUC) extended the duration of federal UI benefits by 53 weeks for those who had exhausted their regular state benefits.

The contribution of these three expansions to claims volume and cost evolved over time. Figure 2.1 shows continuing UI claims and cost, both state and federally financed, by month; Figure 2.2 shows the evolution of continuing UI claims volumes by program.⁶ Regular state claims surged immediately when the pandemic first hit. Once the PUA program got up and running, it accounted for roughly 40 percent of total claims until it expired. PEUC claims increased steadily as workers faced longer-term unemployment, accounting for roughly a quarter of claims by December 2020 and a third of claims between March and September 2021 when it expired. In 2020 the cost of the expansions was roughly \$400 billion, of which supplements cost \$282 billion (71 percent), PUA \$80 billion (20 percent), and PEUC \$29 billion (7 percent) (U.S. Department of Labor [DOL] 2021).

In addition to these expansions, administrative barriers to accessing UI benefits were lowered, enabling states to dramatically and swiftly expand UI coverage. For example, UI benefits are typically available only to those who lose their jobs through no fault of their own. In normal times, the UI system requires former employers to verify whether workers are ineligible for UI because they had been fired for cause, did not respond to a recall, or had started working in a new job. During the pandemic these reporting requirements were relaxed. In addition, work search requirements were waived, meaning that recipients

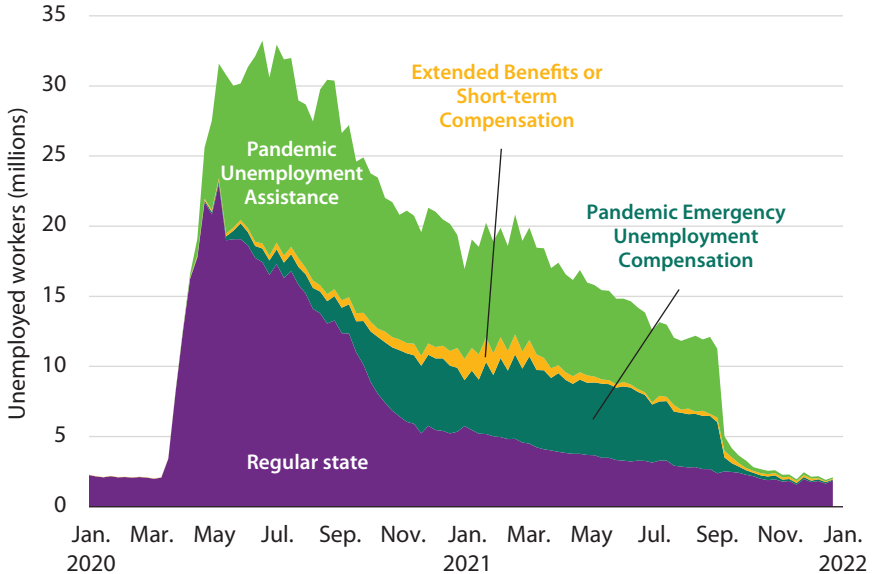
4. LWA was not part of the FPUC but rather was a FEMA disbursement authorized through executive order. Some states matched LWA with an additional \$100 for a total weekly supplement of \$400.

5. Generally speaking, to qualify for UI, a person must have lost their job through no fault of their own, be able to work, available to work, actively seeking work, and have earned at least a certain amount of money during a base period prior to becoming unemployed.

6. As documented by Cajner et al. (2020), there were various problems with UI claims data, potentially distorting the continued claims estimates in figures 2.1 and 2.2. For example, some PUA recipients were double counted as being on both PUA and regular UI. In addition, some states report all retroactive claims during the week the individual received their first payment.

FIGURE 2.2

Weekly Continued Unemployment Insurance Claims, by Program



Source: U.S. Department of Labor n.d.b.

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did not have to prove that they were looking for a job in order to continue to receive benefits. Finally, unemployed workers typically have to be unemployed for a week before benefits can be paid; this waiting period was waived in the Coronavirus Aid, Relief, and Economic Security Act (CARES Act).

Evaluating COVID Unemployment Insurance Policies

The conceptual framework typically used by economists to think about how best to structure UI benefits frames the issues as a trade-off between protection (i.e., replacing lost earnings to prevent a drop in consumption) and inefficiency (i.e., creating disincentives to find a job and incurring administrative costs to prevent fraud and other overpayments). During an economic downturn, the benefits of protection increase, because, in addition to supporting households, the boost to consumption helps stabilize the macroeconomy. In addition, efficiency losses decrease because it is more difficult to find a job when labor demand is low, meaning that any decrease in job search has less impact on actual

employment, especially considering that any one person who is not looking for a job might make it easier for another person to find one. Both channels tilt in favor of greater insurance provision in an economic downturn because the benefit of protection increases and the cost of efficiency losses decreases.

In addition to this trade-off, policymakers might wish to insure a greater share of consumption for lower-wage workers than for higher-wage workers, both because higher-income workers are more likely to have savings to help them smooth through periods of unemployment and because cuts to consumption for those whose budgets are already very tight are likely to be much more painful. The lower costs of disincentive effects further support the case for particularly generous UI for lower-wage earners during recessions.

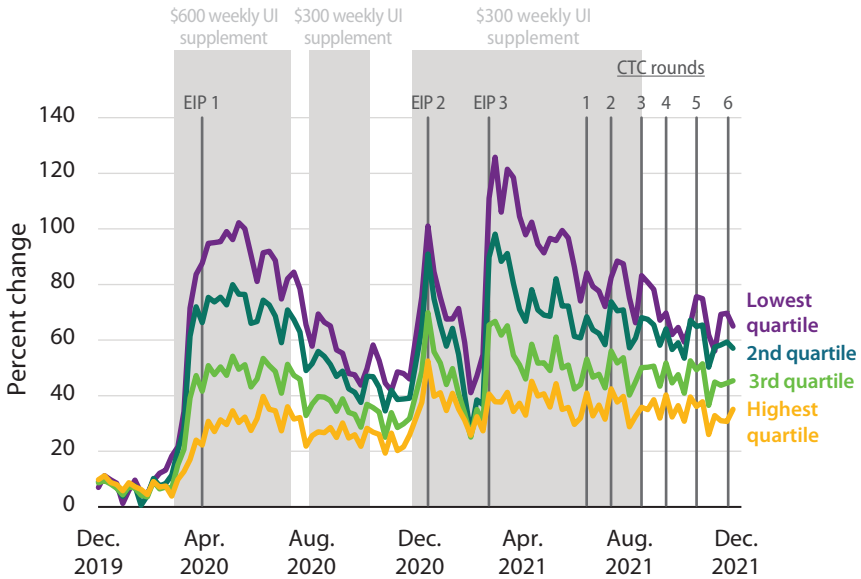
A central question is how the pandemic UI policies affected this trade-off—that is, how much they increased protection by increasing access to UI and boosting the level of benefits versus how much they lowered program efficiency in terms of work disincentive effects and fraud or other overpayments.

In addressing this question, it is important to recognize three ways in which the COVID-19 downturn differed from other recessions. First, this recession was born out of a public health threat. Thus, UI was meant to insure people against income losses associated not just with involuntary job loss, as in a usual recession, but also with the choice not to work due to the public health risk. Second, job losses were dramatic and were concentrated in lower-paid in-person service sectors such as restaurant, travel and hospitality, and retail (Bell et al. 2021a). Third, UI was just one of a variety of government-support policies aimed directly at households, including three rounds of stimulus checks (Economic Impact Payments [EIP]), debt forbearance, advance payment of child tax credits, and rent relief. Still, total UI payments in 2020 (\$572 billion) were more than double the EIP payments (\$275 billion). By 2021 UI claims had dropped considerably; at the same time, families received two more rounds of EIPs, and roughly a quarter of families received the monthly advanced Child Tax Credit (CTC) between July and December. Nevertheless, in 2021 total UI payments (\$340 billion) were not that much lower than stimulus (\$569 billion) and were considerably larger than advanced CTC (\$128 billion). Collectively, these income supports put a lot of money in the hands of families. As of the end of 2021, according to data from the JPMorgan Chase Institute (JPMCI; Greig, Deadman, and Sonthalia 2022), described below, cash balances were 65 percent higher than 2019 levels for low-income families, potentially influencing a range of economic decisions, including the decision whether to return to work (Figure 2.3).

Because of the nature of the COVID-19 recession and the accompanying policy interventions, it is difficult to disentangle enduring policy lessons from those that are unique to the pandemic. In the following discussion we underscore where there is uncertainty in the extent to which outcomes might be unique to the COVID-19 era.

FIGURE 2.3

Percent Change in Median Weekly Checking Account Balances Relative to 2019, by Income Quartile



Source: Greig, Deadman, and Sonthalia 2022.

Note: We assign households into income quartiles based on their total income from 2019. Households in the lowest quartile earned between \$12,000 and \$26,171 in labor income; 2nd quartile households earned \$26,171 to \$40,826; 3rd quartile households earned \$40,826 to \$64,974; and highest quartile households earned more than \$64,974.

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Data Sources

A range of data sources shed light on the impacts of UI during the COVID-19 recession, many of which were not available in prior recessions, allowing for richer and more-contemporaneous evidence to inform policy. UI claims data and payroll data published by the Bureau of Labor Statistics provide aggregate estimates of UI flows and stocks and concurrent changes in aggregate employment, but these estimates come with large confidence intervals and do not shed light on the impacts of UI for a given UI recipient. During COVID-19 the U.S. Census Bureau launched the Household Pulse Survey, offering a timely nationally representative survey of households that provided insight into the demographics of UI applicants and recipients alongside other worker outcomes.

Administrative data sets also provided a window into the impacts of UI across a range of important outcomes. The largest and most representative of such data sets is the JPMCI data which observed more than a million deidentified UI recipients during the pandemic. JPMCI data are limited in that they capture only claimants with bank accounts at Chase who receive their UI benefits via direct deposit. About half of UI benefits in 2020 were paid via prepaid cards, and are therefore excluded from the sample. UI distribution varies by state; in California most UI payments are made through prepaid cards. In addition, for the subset of claimants previously working at large firms for whom the JPMCI data capture industry, the industry distribution is different from the national distribution among UI recipients according to DOL UI data: for example, the two most underrepresented industries in the JPMCI data are construction and agriculture, and the two most overrepresented industries are public administration, and finance and insurance. Still, Ganong, Greig, Liebeskind, et al. (2021) show that the JPMCI data mirror both pre-pandemic characteristics, such as the income distribution of UI recipients and benefit levels by state from the DOL, and pandemic patterns, such as the huge rise in UI claims nationally and by state and changes in industry composition. The data provide a window into each individual's UI spell and path of income, spending, and liquid assets and shed light on distinct UI programs—regular UI versus PUA (e.g., Ganong, Greig, Liebeskind, et al. 2021; Ganong, Greig, Noel, et al. 2021; Greig, Sullivan, and Anderson et al. 2022).

Earnin, a financial services company that provides workers with early access to their earned wages when users connect their bank accounts, made publicly available sample data on roughly 19,000 mostly low-income users (Coombs et al. 2021). The California Policy Lab offered a window into administrative UI data for California, delivering insights into not just who was receiving UI, but also insights into many administrative aspects of the program that we discuss below (see, for example, Bell et al. 2021b).

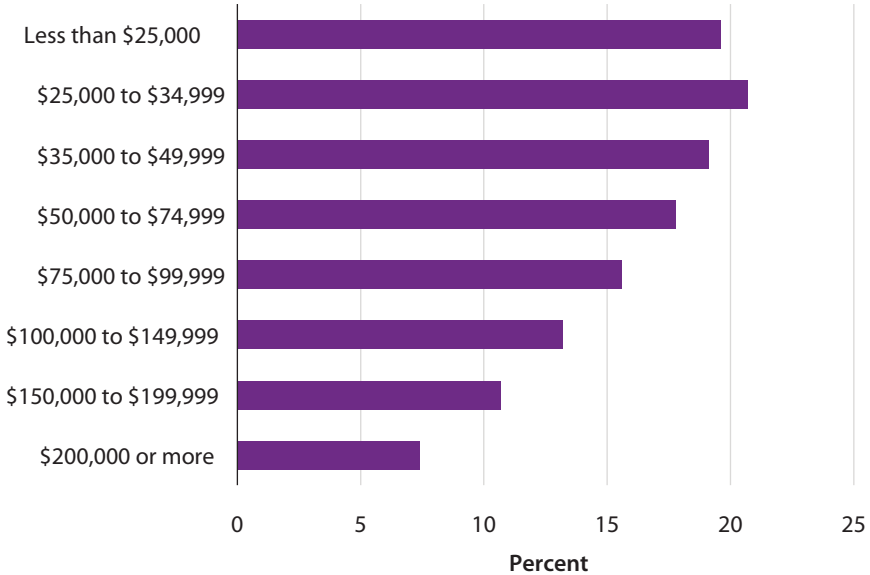
Empirical Lessons

UI Policy Expansions Were Highly Progressive in That They Offset Income Losses and Delivered the Most Benefit to Lower-Income Workers

Job losses were concentrated in low-wage service sectors. Thus, the typical UI recipient was a lower-income worker. For example, according to the Household Pulse Survey, between August and December of 2020, roughly 20 percent of workers earning less than \$35,000 per year received UI, compared to fewer than

FIGURE 2.4

Reported Unemployment Insurance Receipt in 2020, by 2019 Income



Source: Carey et al. 2021.

Note: Data are pooled from August 19, 2020 and December 21, 2020. Income groups are based on 2019 total household income (before taxes).



15 percent of workers earning \$100,000 or more (Carey et al. 2021).⁷ JPMCI data document a similar income gradient in UI receipt (Figure 2.4; Greig, Deadman, and Noel 2021), and also show that renters were more likely to receive UI than were mortgage holders (Greig, Zhao, and Lefevre 2021).

Although the distributional consequences of the COVID-19 recession might have been more severe than during other recessions, it is common for job losses to be concentrated among lower-income workers both in general (Keys and Danzinger 2008; Mincer 1991) and during recessions (Forsythe and Wu 2021; Hoynes, Miller, and Schaller 2012; Shibata 2021). This implies that, during recessions, by targeting support to individuals who have lost a job, UI disproportionately channels relief to lower-income workers.

7. It is worth noting, as Carey et al. (2021) document and we discuss later, that UI reciprocity rates tend to be lower among lower-income workers.

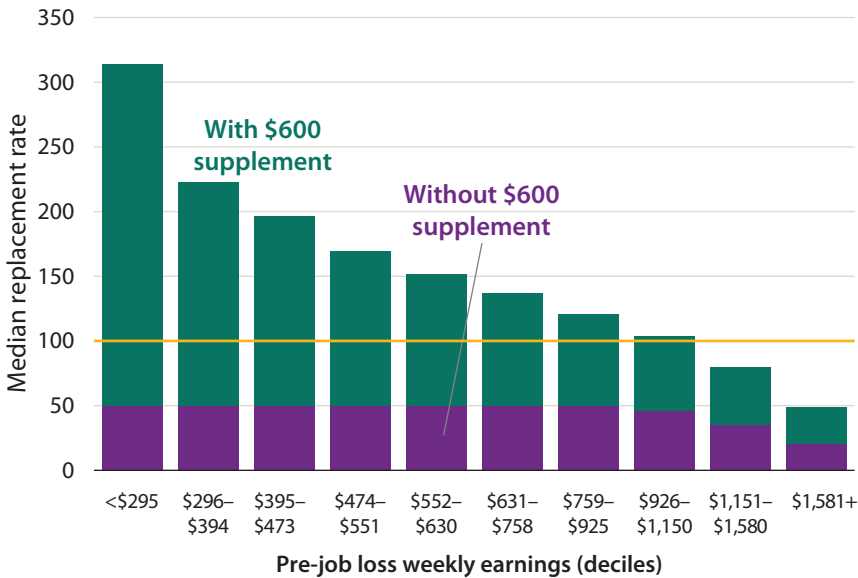
The extended duration of UI under the PEUC program—which extended benefits to an additional 53 weeks—disproportionately benefited women, less-educated workers, and people of color, because these workers, according to the California Policy Lab, were more likely to experience long-term unemployment in California (Bell et al. 2021a). Notably, more than half of all workers benefiting from PEUC in February 2021 had no more than a high school degree, despite those workers making up just 33 percent of the labor force (Bell et al. 2021a). In addition, those at risk of losing benefits in December 2020, before PEUC was extended, disproportionately worked in low-wage sectors such as accommodation, food services, and retail (Bell et al. 2020a).

Turning to the weekly supplements, a key policy goal of the supplements was to raise UI replacement rates to compensate workers who had lost their job or who were unable or unwilling to work due to COVID-19. The fragmented state-based UI IT systems made it infeasible to target a uniform replacement rate by tailoring the supplement amount to pre-job loss earnings. As a result, a flat nationwide weekly supplement of \$600 was set, which was largely based on a national mean pre-job loss earnings level of workers who were unemployed before the pandemic began.

These flat weekly benefit supplements, initially \$600 and then reduced to \$300, had three key effects on the income distribution. First, they dramatically increased income replacement rates (UI benefits as a percentage of wages on the lost job) for all UI recipients from a median of 50 percent under regular UI to 145 percent under the \$600 supplement and roughly 100 percent under the \$300 supplement. Second, the fixed dollar supplements, by construction, were highly progressive in that they delivered greater relief to lower-income workers. With the \$600 weekly supplement, a typical worker in the bottom two deciles of the income distribution has a replacement rate of more than 200 percent (Figure 2.5). Accordingly, as Bell et al. (2020b) document, this had the effect of delivering higher-income replacement rates among women, and among Black, lower-educated, and younger workers. Third, while this policy was highly progressive in targeting more relief to lower-income workers, it created horizontal inequity between the employed and unemployed: jobless workers received more in unemployment benefits than similarly paid workers who remained employed, often while taking on greater health risk.

In sum, the UI expansions were highly progressive in terms of who received benefits as well as the benefit levels and durations. All told, expanded UI benefits are credited with lowering the official poverty rate in 2020 by 1.4 percentage points, and with lowering it by 2.5 percentage points among Black households (Chen and Shrider 2021). This effect is likely understated because UI benefits are significantly underreported in the Current Population Survey, the data set used to calculate official poverty measures; just 40 percent of UI benefits were captured in the 2020 survey.

FIGURE 2.5
Median Unemployment Insurance Replacement Rates Across the Income Distribution



Source: Ganong, Noel, and Vavra 2020.

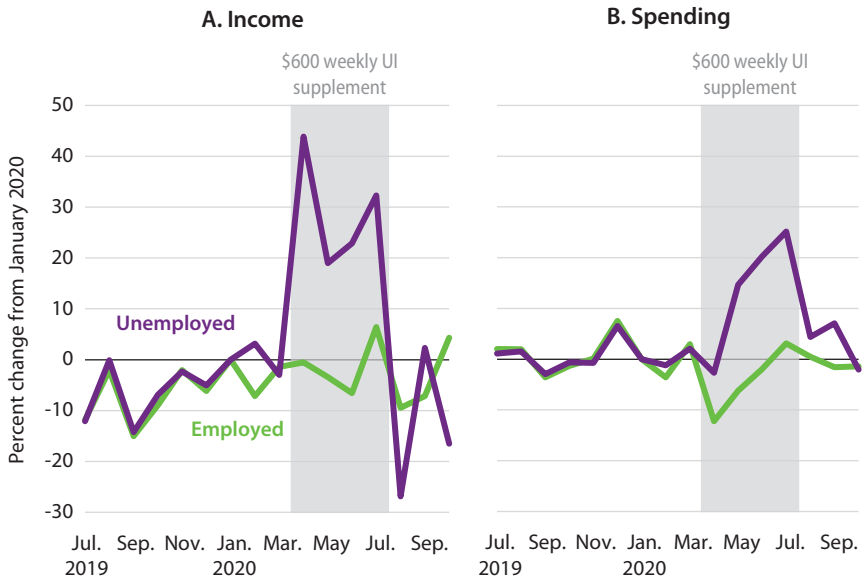


The Spending Impacts of UI Were Large: UI Benefits Provided a Powerful Stimulus to the Macro Economy by Boosting Consumption, Particularly among Low-Income and Low-Liquidity Workers

Spending was highly responsive to unemployment benefits through COVID-19, providing a significant boost to the macroeconomy. Figure 2.6 compares the income and spending trends between matched samples of jobless and employed workers with similar pre-pandemic incomes. Ganong, Greig, Liebeskind, et al. (2021) estimate that spending among jobless workers increased by more than 20 percent with the arrival of the \$600 supplements at a time when spending among the employed was depressed. When the \$600 supplement phased out in August 2020, spending among jobless workers dropped. Spending then temporarily increased in September 2020 with the arrival of \$300 in LWA.

FIGURE 2.6

Percent Change in Income and Spending from January 2020, by Employment Status



Source: Ganong, Greig, Liebeskind, et al. 2021.

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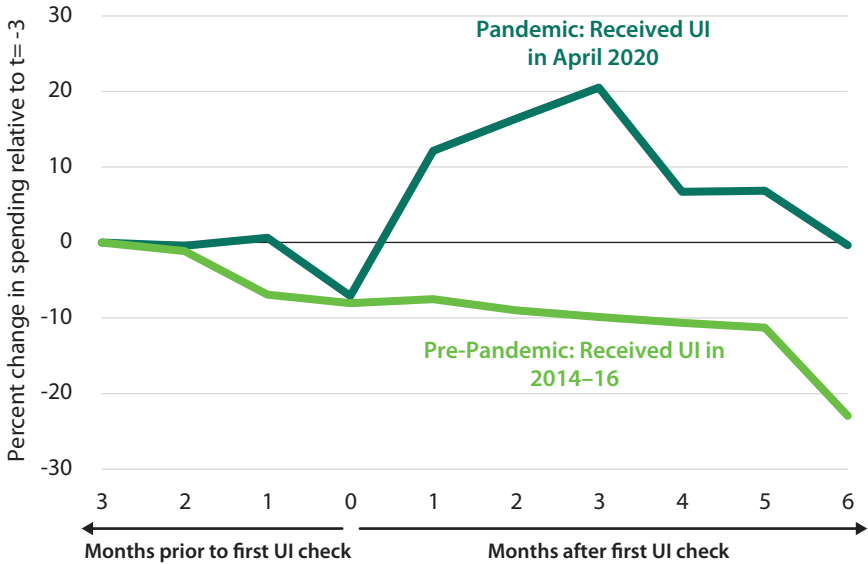
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Spending also dropped significantly when workers lost their benefits entirely, underscoring the impact of extended benefits (Figure 2.7). This is evident when comparing the path of spending among jobless workers who received UI benefits during the pandemic (from Ganong, Greig, Liebeskind, et al. 2021) versus workers who received UI benefits in pre-pandemic times (Ganong and Noel 2019). In most states, jobless benefits normally last six months, after which workers cut their spending (Figure 2.7, light green line). During COVID-19, in contrast, the federal PEUC program extended UI benefits an additional 53 weeks, boosting spending beyond the six-month mark (dark green line). Similarly, Coombs et al. (2021) document a 20 percent drop in spending among jobless workers in the 26 states that turned off expanded benefits before the federal expiration in the summer of 2021.

These spending responses imply a relatively high marginal propensity to consume (MPC) out of UI benefits. Ganong, Greig, Liebeskind, et al. (2021) estimate a one-month MPC of 0.43 at the onset of the \$600 supplement and a 0.29 MPC at the expiration of the \$600 supplement. Coombs et al. (2021)

FIGURE 2.7

Percent Change in Spending Relative to Three Months Prior to First Unemployment Insurance Check



Source: Ganong, Greig, Liebeskind, Noel, Sullivan, and Vavra 2021; Ganong and Noel 2019.



estimate an even greater MPC of 0.52, albeit for a lower-income sample, when the 26 states terminated benefits.

To assess whether these MPCs are big or small, we compare them to two benchmarks: previous estimates on MPCs following job loss, and MPCs out of stimulus payments in the Great Recession and during COVID. Although the Congressional Budget Office (CBO) often discusses spending impacts when UI expansions are debated (e.g., CBO 2020), there is little direct empirical evidence of how spending is affected by UI expansions.

Much of the past literature uses survey data, which has a number of limitations discussed in Ganong and Noel (2019). Ganong and Noel (2019) instead use JPMCI data from pre-pandemic, nonrecessionary times to estimate spending responses to regular unemployment benefits, which replace 30–50 percent of lost income. MPC estimates are quite sensitive to choices of the categories of account outflows included in the spending measure (e.g., nondurable

spending versus total account outflows for any purpose).⁸ For this reason, we compare MPC estimates based on total account outflows that are present in both papers: Ganong, Greig, Liebeskind, et al. (2021) compute a one-month MPC on total account outflows of 0.69, compared to the 0.83 pre-pandemic number in Ganong and Noel (2019), suggesting a slightly lower MPC out of these large UI supplements during the pandemic than out of regular UI in pre-pandemic times. However, this difference is relatively small, implying that MPCs out of these supplements were similar to MPCs out of regular UI even though the supplements were much larger and occurred during a pandemic that depressed overall spending.

More importantly, all past empirical evidence focuses on how spending responds to *regular* unemployment benefits and not to the much larger *supplements* implemented during the pandemic. In principle, spending responses to small benefit changes could differ markedly from spending responses to large benefit increases, since the latter have larger effects on unemployed households' liquidity positions.

In contrast to UI spending impacts, there is a large and growing literature on the spending impacts of stimulus payments. This is an interesting comparison, insofar as stimulus is another commonly used countercyclical fiscal policy, and the identification strategies for estimating effects, which typically exploit variation in timing in the arrival of payments, are similar. Estimates of the MPC from stimulus payments vary widely depending on the spending measure and the income and liquidity levels of the family, making comparisons across papers with different data sources and samples difficult. Nevertheless, Kaplan and Violante (2014) summarize the findings from the pre-pandemic literature and argue for a target three-month nondurable MPC of 25 cents per dollar. Using Nielsen spending data, Broda and Parker (2014) find that the one-month MPC out of rebates is 30–50 percent less than the three-month response. Applying this same ratio to the 0.25 MPC suggests a one-month MPC of nondurables to tax rebates of 0.125 to 0.175, which is substantially below the one-month MPC of 0.43 that Ganong, Greig, Liebeskind, et al. (2021) estimate to the start of unemployment benefits.

Several studies have estimated the MPC from stimulus payments, or EIPs, during the pandemic. Two studies use Factiveus debit card account data held by lower- and middle-income households and estimate an MPC of between 0.29 and 0.51, depending on the spending measure (Misra et al. 2021) and 0.46 out of the first round of stimulus and 0.39 out of the second round of stimulus (Karger

8. Ganong and Noel (2019) estimate a one-month MPC at the start of UI benefits of 0.27 on nondurable spending (on credit and debit cards, as well as on electronic payments) and 0.83 on total account outflows. The MPC estimates of 0.43 at the onset of the \$600 supplement and 0.29 at the expiration of the \$600 supplement reflect a broader spending measure (including spending on credit and debit cards, cash, paper checks, and various electronic payments) that are not directly comparable to the MPC on nondurable spending in Ganong and Noel (2019).

and Rajan 2020). Baker et al. (2020), using data on 90,000 low-income users of a personal finance app, estimate a 10-day MPC of between 0.25 and 0.40. Greig, Sullivan, et al. (2022), also using JPMCI data on 1 million households, estimate a lower MPC out of EIP than UI, and lower MPCs still from the second and third rounds of EIP (see Chapter 3 of this volume).

In short, spending impacts out of UI generally appear to be larger than spending impacts out of stimulus payments. This likely reflects several factors. First, UI targets support to families that have lost income because one family member has lost a job; that is different from the broader population that received stimulus payments. Second, UI transfers are more persistent than one-off stimulus checks. In most models of consumption, both forces imply greater MPCs out of UI than out of stimulus checks. This stronger spending response out of UI makes it an attractive policy for stimulating aggregate demand, although this must be balanced against the benefits of other targeting approaches, horizontal equity considerations between employed and unemployed workers, as well as potential negative consequences from reduced labor supply, which we discuss next.

Work Disincentive Effects from UI Benefits Were Small during the Pandemic, Especially When Compared to Historical Standards

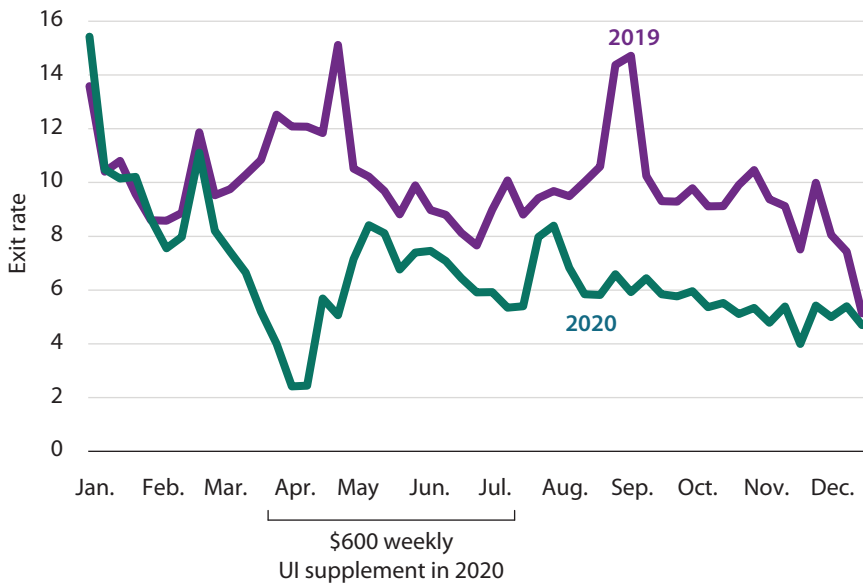
Many policymakers were concerned that the high levels and long durations of UI payments might deter workers from returning to work. These concerns became particularly pronounced in the spring of 2021 when employers started to experience labor shortages. UI became a prime suspect in the case of the missing workers when, in March 2021, job openings surged above pre-pandemic levels to roughly 8 million while there were still 8 million fewer employed workers than before.

A variety of studies provide clear evidence that the impact of UI supplements on job finding were remarkably low by historical standards. This is evident from a simple descriptive time series of exit rates out of UI, a proxy for job search.⁹ First, focusing on total exit rates, which include both recalls to prior employers and exits to new jobs, Ganong et al. (2022) document that, although total UI exits remained lower in 2020 than in pre-pandemic times, the weekly exit rate from unemployment showed a very brief but not sustained increase when the \$600 UI supplement expired at the end of July 2020 (Figure 2.8).

9. UI recipients can exit UI for a variety of reasons: they can be recalled by their prior employer, find a new job, exhaust their UI benefits, or face an administrative or policy hurdle that causes a lapse in their benefits. All these forces were in play at different points during the pandemic. But, at the start of the pandemic, benefit expiration was not a factor given the additional 53 weeks of benefits available.

FIGURE 2.8

Weekly Exit Rate from Unemployment Benefits



Source: Ganong et al. 2022.



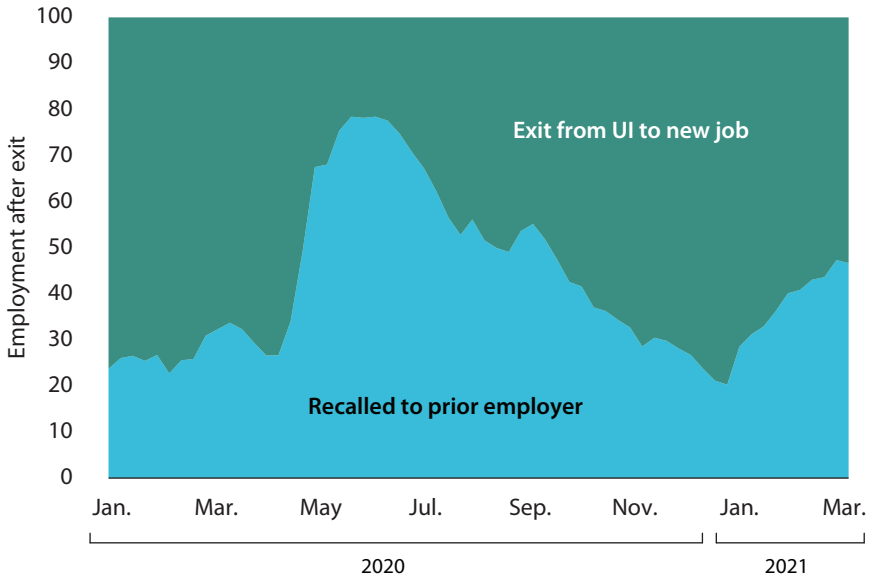
Indeed, the weekly exit rate between August and December 2020 remained much lower than that rate had been in 2019, when the \$600 supplements were not in place.

In addition, an enormous number of people exited from UI while the \$600 supplements were still available. Ganong, Greig, Liebeskind, et al. (2021) estimate that 53 percent of jobless workers who received the \$600 supplement returned to work before the \$600 supplement expired. Put another way, more than half of jobless workers receiving UI opted to go back to jobs, the vast majority of which paid less than unemployment benefits did with the \$600 weekly supplement included.

A big reason for the large number of exits while the \$600 supplement was in place was recalls. Roughly 70 percent of workers who exited unemployment in the second quarter of 2020 returned to work at their prior employers (Figure 2.9; Bell et al. 2021c; Ganong, Greig, Liebeskind, et al. 2021). In principle, workers become ineligible for UI if they turn down a suitable job offer, and being recalled to one's prior job is a suitable job offer. However, given difficulties that states faced verifying eligibility during the pandemic (DOL 2021), it might have been difficult for states to enforce this provision, meaning that much of the return to

FIGURE 2.9

Employment After Exit from Unemployment Benefits



Source: Ganong et al. 2022.

Note: New job is defined as a UI exit without a recall, measured using receipt of labor income from a prior employer.

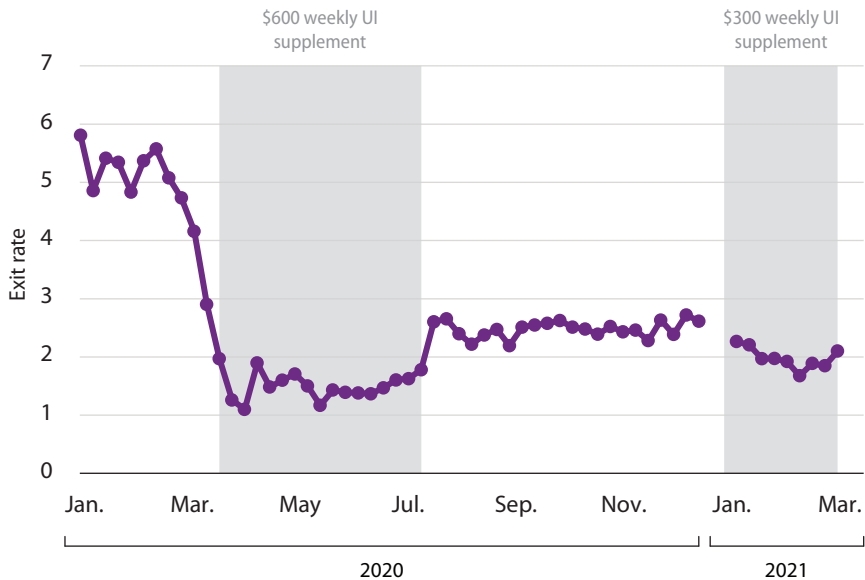


work that did occur was effectively voluntary. Although policy interventions, such as the Paycheck Protection Program, were in place to encourage recalls, the fact that so many workers returned to work despite UI replacement rates exceeding 100 percent is surprising and a policy success, given the spending boost UI supplements generated.

Recognizing that the decision to recall a worker mostly sits with the employer, in quantifying the work disincentive effects, Ganong, Greig, Noel, et al. (2021) focus on the exit rate from UI to new jobs. They find only small changes in exits to new jobs associated with changes in UI supplements. Prior to the pandemic in early 2020, in any given week roughly 5 percent of UI recipients exited to new jobs (Figure 2.10). In April 2020, at the start of the pandemic, the job-finding rate dropped precipitously to below 2 percent as job losses mounted and stay-at-home orders took effect. In August 2020, after the expiration of the \$600 supplement, the exit rate to new jobs increased from 1.6 percent to 2.4 percent. In January 2021, when the \$300 supplement was implemented, the job-finding rate decreased by roughly half a percentage point to 2 percent, which was still significantly lower than the 5 percent pre-pandemic baseline.

FIGURE 2.10

Exit Rate to New Job from Unemployment



Source: Ganong et al. 2022.

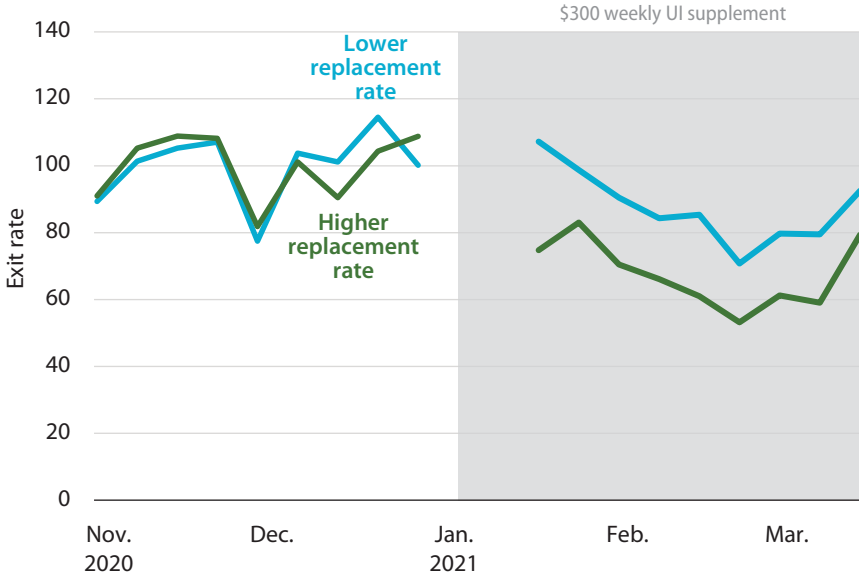


Ganong, Greig, Noel, et al. (2021) deploy two complementary research designs to estimate causal effects of the supplements on job finding. They first compare the magnitude of the change in exit rates when the UI supplement policy changes versus when it does not. They find a larger change in exit rates when the UI policy changes, but the effects are small. Second, they examine changes in UI exit rates when supplements ended and started, and compare the differences in those changes between workers with high- versus low-income replacement rates with the supplement (i.e., lower- versus higher-wage workers, respectively).¹⁰ The rationale is that the supplements represented a larger proportional benefit change for lower-income workers who were thus

10. Ganong, Greig, Noel, et al. (2021) use a difference-in-differences approach comparing fixed groups of UI recipients over time with high- versus low-income replacement rates with the supplement. The key identification assumption is that job finding would have trended similarly between the two groups in the absence of the supplements, even if there were fixed differences between the groups. The authors validate those identifying assumptions by evaluating pre-trends, which are consistent between the two groups, and also controlling for industry, state, and age in order to focus on groups that are as similar as possible other than replacement rates.

FIGURE 2.11

Exit Rate to New Job Relative to November/December Group Average



Source: Ganong et al. 2022.

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more affected by when the supplements were turned off and on. Indeed, they observe larger changes in the job-finding rate among low-income workers, who had higher-income replacement rates with the supplement (Figure 2.11).

Together, these research designs suggest that UI supplements decreased the new job-finding rate by just 0.6 to 1.1 percentage points. They imply a duration elasticity of unemployment with respect to the level of benefit of around 0.1, which implies that doubling the level of UI benefit payments is associated with only a 10 percent increase in the duration a worker remains unemployed. As discussed in Ganong, Greig, Noel, et al. (2021), these duration elasticities are significantly lower than 18 prior studies.

Ganong, Greig, Noel, et al. (2021) estimate that the \$600 supplement reduced employment by less than 0.8 percent and the \$300 supplement reduced employment by less than 0.5 percent. This implies that in the absence of the \$600, an additional 840,000 unemployed workers would have returned to employment by July 2020. Without the \$300 supplement, employment would have been 570,000 higher in August 2021. Looked at a different way, in the absence of the

\$600 supplements, the shortfall of employment relative to February 2020 levels would have been roughly 12.1 million instead of 13.0 million in July 2020. In August 2021 the employment shortfall would have been 4.5 million without the \$300 supplement compared to 5.0 million workers. These changes are small relative to overall pandemic fluctuations in employment, and Ganong, Greig, Noel, et al. (2021) show that they are also small relative to predictions of the labor supply disincentive effects from pre-pandemic evidence.

Notably, several other studies using a variety of data sources, including the Census Household Pulse Survey, similarly concluded that higher income replacement rates from the UI benefit supplements yielded minimal if any aggregate impacts on employment (e.g. Dube 2020, 2021; Finamor and Scott 2021). Thus, although generous UI was initially a prime suspect in the case of the missing workers, the available evidence suggests that generous UI was not in fact a major driver.

Another question is whether the extended duration of UI benefits disincentivized people from returning to work. Here the best evidence from the pandemic comes from studies that evaluated the impacts of UI expiration among the 26 states that opted to end federal UI benefits early (in June and July instead of September 2021). When those states ended benefits early, roughly two-thirds of UI recipients lost UI benefits entirely, and the remaining one-third lost the \$300 weekly supplement but continued to receive regular UI benefits. Coombs et al. (2021), leveraging administrative data from Earnin on a sample of low-income workers, find relatively small impacts of the early termination on job finding: ending pandemic UI increased employment by only 4.4 percentage points compared to the 35 percentage points decline in UI reciprocity among workers who were unemployed, with most of the impact on employment coming from the workers who lost their benefits entirely instead of those who simply lost the \$300 weekly supplement. The small work disincentive effects detected are notable in light of the lower-income sample of workers, who, as Ganong, Greig, Noel, et al. (2021) show, were generally more responsive to UI policy changes. Those authors find that the effect of the policy change on labor supply increased employment by 35,000 in June and 135,000 in July. But terminating expanded benefits in June and July instead of September depressed employment gains in August by 25,000. Those estimates imply that, if benefits had remained in place in all states through September, the unemployment rate would have been 4.8 percent in August, as opposed to 4.5 percent in reality.

Data from representative surveys show slightly larger effects of benefit termination on employment, albeit with wider confidence intervals. For example, a Goldman Sachs (2021) analysis of the household survey of the DOL July jobs report concluded that benefit expiration increased the job-finding rate of jobless workers by 6 percentage points in July 2021 over an average of 27 percent, driven entirely by a 9-percentage-point increase in job finding among those who

lost all UI benefits, and did not just lose the supplement.¹¹ They estimate that, if benefits had expired nationwide, July job growth would have been 400,000 higher at more than 1.3 million, albeit with a wide confidence interval of 25,000 to 650,000. The authors note that, in fact, there was no observed aggregate increase in employment in the states that ended UI early due to the fact that there were offsetting decreases in labor force participation, suggesting that many workers have left the workforce for nonfinancial reasons and are less influenced by the end of UI benefits. Holzer, Hubbard, and Strain (2021) using Current Population Survey (CPS) data estimate that the flow of unemployed workers into employment increased by 14 percentage points following early termination of benefits in June and July of 2021, and that the unemployment rate in July and August 2021 would have been 0.3 percentage points lower had all states opted to terminate benefits in June, on par with estimates from Coombs et al. (2021).

Stepping back, it is helpful to calibrate the relative magnitudes of the impacts of UI benefits on spending and income. Coombs et al. (2021) helpfully compare in dollar terms the large spending drops against the employment gains occurring in a number of states that turned off expanded benefits in the summer of 2021, when labor markets appeared relatively tight. Cumulatively, over the eight weeks after UI benefits expired, jobless workers lost \$1,385 in UI benefits from both supplements and terminations. Over those eight weeks, aggregate earnings increased for workers by just \$93, offsetting only 7 percent of the loss in benefits. As a result, spending fell by \$678 (20 percent), as the loss of benefits led to large immediate declines in consumption. Put simply, the work disincentive effects from expanded UI benefits were small compared to not only the size of the aggregate pool of missing workers, but also the spending boost they generated for jobless workers.

Why were employment effects from expanded UI benefits so much lower during the pandemic than previous estimates? Are those effects unique to the pandemic or should they encourage policymakers to repeat unemployment expansions in the next recession? We discuss five classes of explanations: labor demand, high household liquidity, high recalls, child-care constraints, and health-care concerns.

First, as discussed above, work disincentive effects are likely to be smallest in a recession, perhaps because labor demand is low (Kroft and Notowidigdo 2016; Landais, Michaillat, and Saez 2018; Mercan, Schoefer, and Sedláček 2020). This could have been a factor in the early part of the pandemic in 2020 amid business closures and shutdowns. This line of reasoning implies that we might have seen a larger work disincentive in 2021, when labor market demand was strong. However, as summarized above, Dube (2021) and others estimate small work disincentive effects in the summer of 2021 when UI expansions

11. Goldman Sachs (2021) relies on individual-level data from the household survey of the Department of Labor July 2021 employment report.

were expiring, suggesting low labor demand cannot account for the low work disincentive effects.

Second, increased household liquidity could in theory have slowed UI recipients' return to work, but research during the pandemic suggests that this effect was small. Prior research finds that part of the disincentive effect of UI arises from increased liquidity. For example, Chetty (2008) documents much smaller causal impacts of UI benefits on exit rates among benefit recipients who are not liquidity constrained. This research is relevant for understanding the time period during the pandemic when liquidity was elevated, due in part to a series of policy interventions that included UI supplements, three rounds of stimulus payments, debt forbearance programs, and advanced child tax credits. As shown above in figure 2.4, as of the end of 2021 cash balances were still significantly elevated above pre-pandemic baselines, to the tune of 65 percent for lower-income families (Greig, Deadman, and Sonthalia 2022). However, Ganong et al. (2022) find that incorporating measures of liquidity have little impact on the disincentive estimates. This suggests that higher liquidity did not account for the low work disincentive effects during the pandemic, and that other forces must have been at play.

Third, as documented above, recalls to prior employers made up a large share of reemployments among jobless workers—as high as 70 percent of all UI exits in the summer of 2020, compared to 20 percent in pre-pandemic times (Ganong, Greig, Liebeskind, et al. 2021). (The recall rate does not usually rise and sometimes falls in recessions.) Insofar as the decision to recall sits with the employer, some workers might have been waiting to be recalled to their old jobs, and so their search for new jobs could have been less impacted by financial incentives.

Fourth, school and daycare closures or reduced hours, frequent quarantines, or an unwillingness to use care services because of the threat of virus exposure, may have caused some workers to be hesitant or unable to accept new jobs due to increased care responsibilities. For example, as of summer 2021 visits to early child-care centers were still down by roughly 20 percent relative to pre-pandemic levels (Cascio 2021).

Finally, the pandemic might reduce job search above and beyond a normal recession due to the health risk. It might be more difficult to search for a job during a public health emergency, employers could be recruiting for positions with above-average health risk, or workers may be less willing to return to work given the health risk.

In short, the more plausible explanations are those that are potentially unique to the pandemic. However, empirical work to date offers no smoking gun evidence that definitively accounts for the lower work disincentive effects during the pandemic. Perhaps in light of this, historical publication bias favoring empirical results that document larger disincentive effects might warrant consideration as a sixth possible explanation.

The PUA Program Was Successful in Increasing Access to Benefits and Insuring Income Losses for Workers on the Margins of the Labor Market without Clear Evidence of Greater Work Disincentive Effects

The PUA program marked a significant expansion in the UI eligibility framework. PUA provided benefits to individuals who were not otherwise eligible for regular UI benefits, including the self-employed, those seeking part-time employment, and individuals lacking sufficient work history. It was generally not payable to individuals who were able to telework or who were receiving paid leave. It did make eligible individuals who were unable or unavailable to work for a variety of COVID-19 related reasons, including instances where the worker or family member was diagnosed with COVID-19, had primary caregiving responsibility for a member of the household as a result of COVID-19, or became the primary source of income if the primary breadwinner died due to COVID-19. It remains unclear exactly which types of PUA eligibility were most common. DOL data (DOL n.d.) suggest that the share of eligible PUA claimants who were self-employed was 41 percent in 2020 and 49 percent in 2021. Bell et al. (2021a) report that most PUA recipients in California were self-employed. In order to evaluate work disincentive effects of this program it is critical to understand the extent to which individuals qualified for PUA for reasons unrelated to work.

Other key design questions were whether and how to verify income and set benefit levels. As mentioned above, PUA represented a meaningful departure in the policy framework insofar as it did not require employer verification of prior earnings or eligibility, but instead relied on the applicant to provide documentation.¹² PUA claims were meant to document ineligibility for regular UI on the application. Many states did so by requiring workers to first apply for and then be denied regular UI benefits before applying for PUA.

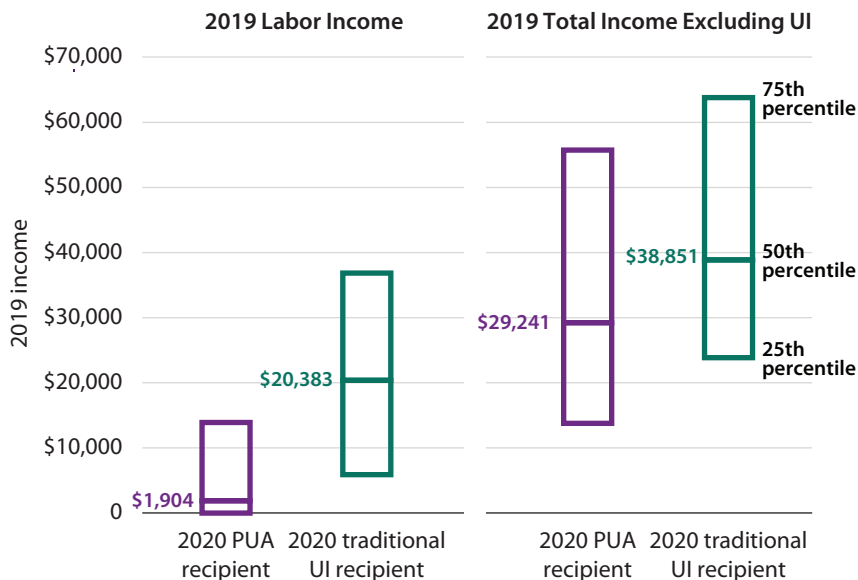
As for benefit levels, rather than receive a flat benefit level, PUA recipients were required to provide documentation to verify their income. Weekly benefits were set at 50 percent of prior weekly income, subject to the state minimum benefit level. All told, the PUA program dramatically expanded UI eligibility, representing roughly 40 percent of total UI claims.

Who benefited from this program and what was its impact? There is little empirical evidence on the impact of PUA. The JPMCI data were able to distinguish between PUA and regular UI in a handful of states that paid the benefits via separate channels (i.e., they carried different transaction descriptions when

12. Initially, eligible individuals were required only to self-certify that they could not work due to a COVID-19 related reason. The CARES Act increased documentation requirements, requiring applicants to provide proof of employment, self-employment, or a qualifying job offer (Pandemic Response Accountability Committee 2021).

FIGURE 2.12

Distribution of 2019 Income for 2020 Unemployment Insurance Recipients, by Program



Source: Greig, Sullivan, and Anderson et al. 2022.

Note: Total Income includes all inflows into checking account excluding UI payments themselves. Sample includes those who received any UI or PUA payments in 2020.

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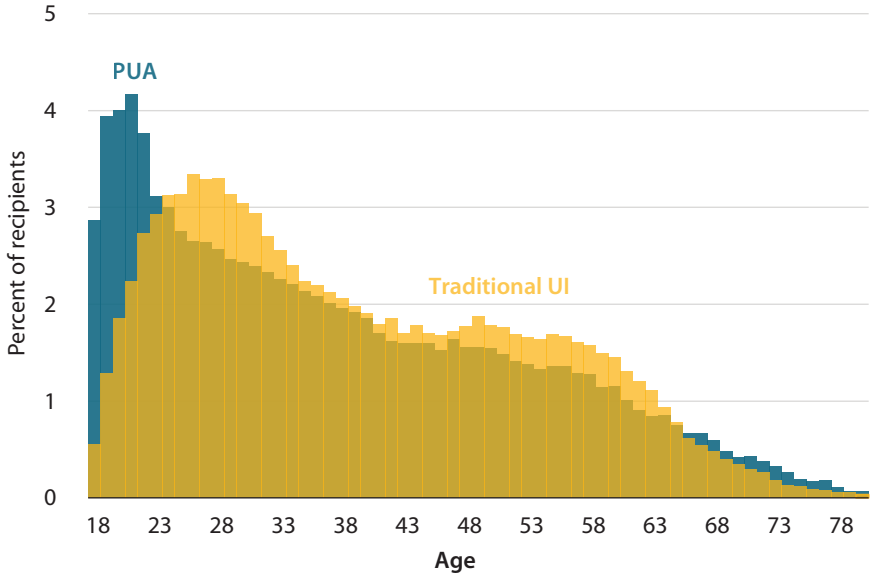
directly deposited into bank accounts).¹³ The California Policy Lab also was able to distinguish between regular recipients and PUA recipients in administrative California state data. We summarize key insights from those two sources of data.

PUA disproportionately benefited lower-income families and those who were more marginally attached to the labor market (Greig, Sullivan, and Anderson et al. 2022). We offer three illustrations of this statement. First, JPMCI documented that PUA recipients had lower direct deposit labor income—characteristic of more formal employment arrangements—and also lower total income in 2019 than did traditional UI recipients (Figure 2.12). Second, the JPMCI data also show that the PUA program disproportionately benefited both younger workers with more-limited work histories and older, potentially

13. These states are Ohio (45.3 percent of sample), New Jersey (47.6), Massachusetts (3.6), West Virginia (3.2), Arkansas (0.3) and Vermont (0.2). According to DOL data (DOL n.d.c), these states account for roughly 5 percent of total initial claims nationally.

FIGURE 2.13

Age Distribution of Unemployment Insurance Recipients, by Program



Source: Greig, Sullivan, and Anderson et al. 2022.

Note: Distribution of age for UI and PUA recipients in 2020. Recipients include those who had age information associated with an account in January of 2020 and those who received any UI or PUA payments in 2020.

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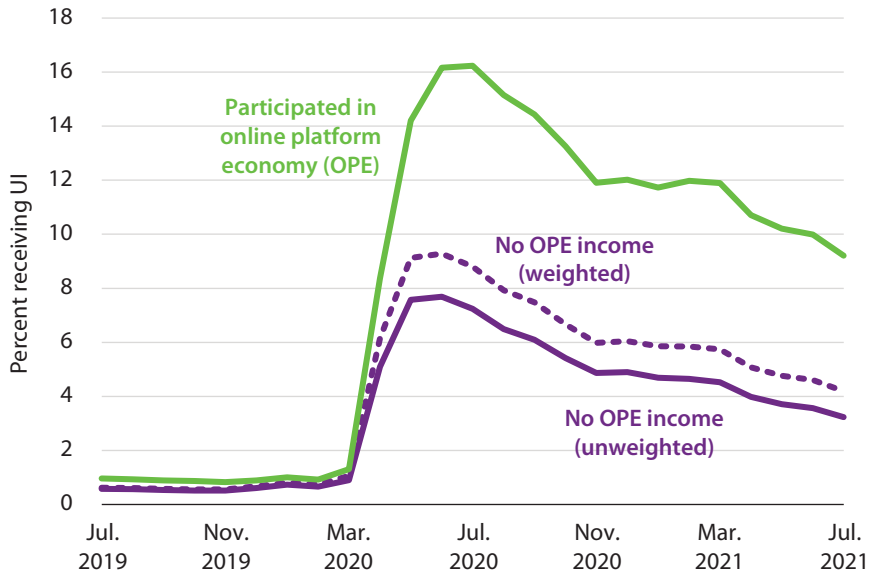
semi-retired, workers (Greig, Sullivan, and Anderson et al. 2022; Figure 2.13). This was also evident in California (Bell et al. 2021a).

Third, contingent workers saw a larger increase in UI receipt during the pandemic (Figure 2.14). For example, families who in 2019 had earned income from the Online Platform Economy (OPE), a subset of contingent work facilitated by online platforms such as rideshare apps, were much more likely to receive UI in 2020 and 2021 than those without such income (Greig and Sullivan 2021). Prior to the pandemic, OPE workers were 61 percent more likely to receive UI in the last six months of 2019 than were workers who had not earned platform income. During the pandemic this increased to 138 percent for the last six months of 2020, suggesting a larger proportional increase in UI receipt among OPE workers than non-OPE workers.¹⁴ The PUA program

14. We see similar results after reweighting non-OPE workers to match the joint age-income distribution of the OPE sample: OPE workers were 50 percent more likely to receive UI in

FIGURE 2.14

Share of Workers Who Received Unemployment Insurance, by Online Platform Economy Participation



Source: Greig and Sullivan 2021.

Note: Online platform economy (OPE) sample is all those who earned OPE income in 2019, while the non-OPE sample is those who never earned OPE income in JPMCI data. Weighted non-OPE sample is reweighted by age-income bins to match the joint age-income distribution of the OPE sample.

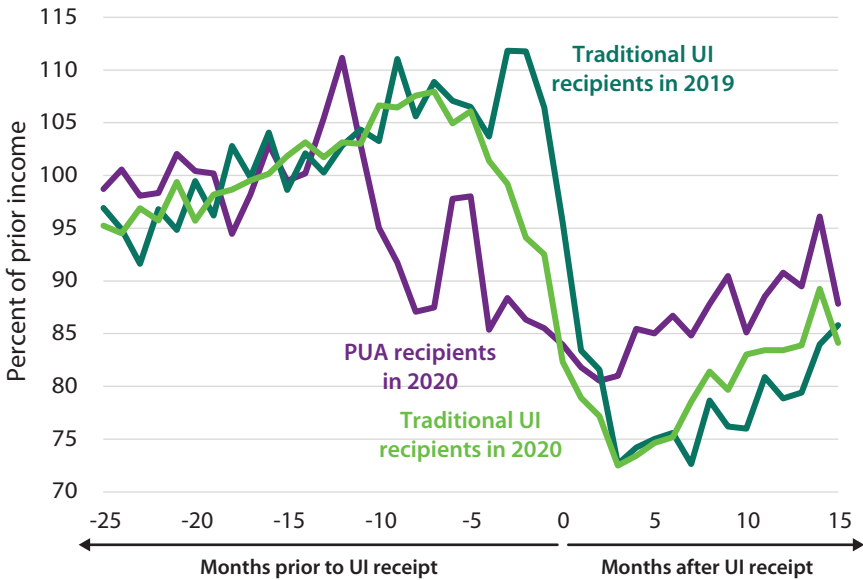


provided meaningful income insurance that would not have been covered by the regular UI program. Delays in UI payments make it difficult to know exactly when workers experienced job loss and the magnitude of their income loss. In fact, by the time they got their PUA payments, some PUA recipients might have already returned to work. Notwithstanding these measurement challenges, Figure 2.15 shows the change in workers' total income (excluding UI benefits) around the time of first benefit receipt (Greig, Sullivan, and Anderson et al. 2022). As a reference point, 2019 UI recipients experience a sharp 30 percent

the second half of 2019 compared to 94 percent in the second half of 2020. In the absence of the PUA program, it might seem surprising that OPE workers were more likely to receive UI than non-OPE workers, but Farrell, Greig, and Hamoudi (2019) document that workers turn to the OPE to generate income when they involuntarily lose a job, as identified by UI receipt.

FIGURE 2.15

Percent of Prior Income Around the Week of the First Unemployment Insurance Receipt, by Program



Source: Greig, Sullivan, and Anderson et al. 2022.

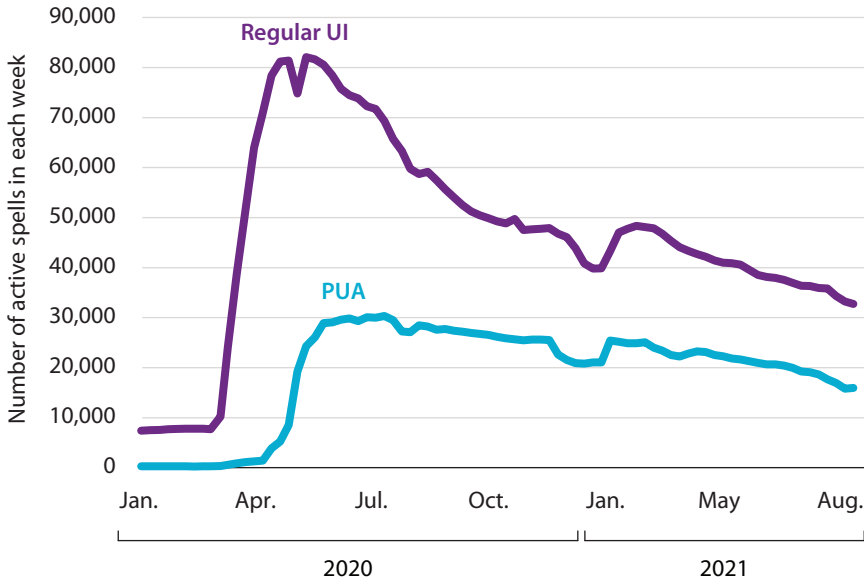
Note: Average weekly total income excluding unemployment payments for UI recipients in 2019 and 2020 and PUA recipients in 2020. Weekly time-series is normalized by the average of total income from between 25 and 9 weeks prior to receiving any UI payments in or after April 2019 and those who received any UI or PUA payments in 2020.



drop of income right before they get their first UI payment. This lines up with workers losing their income one or two weeks before their first UI payment. In 2020, when UI payments were more likely to be delayed, there is a 30 percent drop in income but the drop is not as sudden because some workers had been laid off for several weeks before receiving their first UI payment. PUA recipients' income drops about 20 percent from peak to trough, but there is no steep drop off as with the UI recipients. This is what we would expect if some workers experienced their income loss six, seven, or eight weeks before benefit receipt, which in the aggregate creates a much more gradual decline in income. Moreover, if some workers returned to work before receiving their first benefits, this would effectively hide the total extent of their income loss. Despite these various measurement problems, the data suggest that PUA did in fact compensate recipients for significant income loss.

FIGURE 2.16

Regular Unemployment Insurance and Pandemic Unemployment Assistance Active Spells, January 2020–August 2021



Source: Greig, Sullivan, and Anderson et al. 2022.

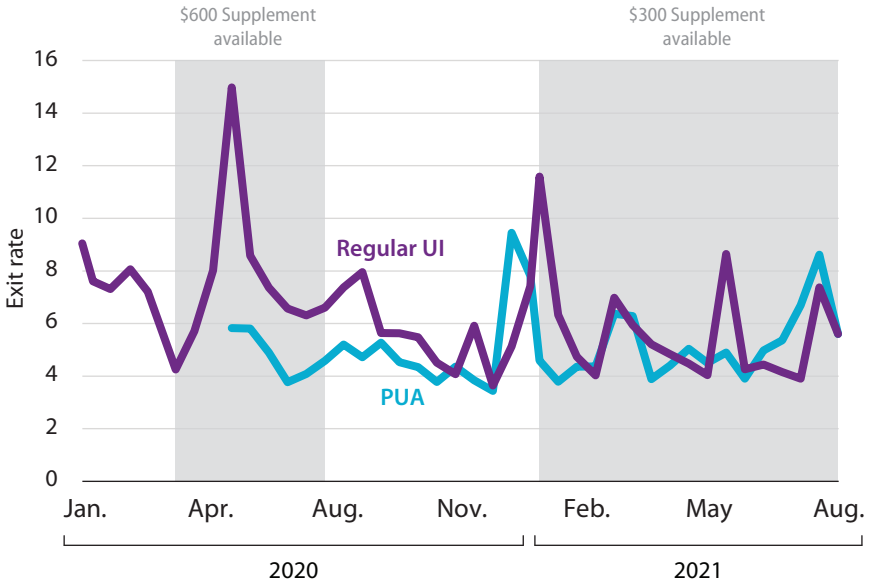


Next, we turn to the question of whether PUA recipients exhibited greater work disincentive effects than regular UI recipients. In contrast to causal evidence summarized above for all UI recipients, here the evidence is purely descriptive. On the one hand, Bell et al. (2021a) document that PUA recipients in California were more likely to experience long-term unemployment than were regular UI recipients: as of mid-February 2021, 59 percent of PUA recipients compared to 44 percent of regular UI recipients had received benefits for 26 weeks or more. Additionally, Greig, Sullivan, and Anderson et al. (2022) use JPMCI data to document that PUA claims fell more slowly than regular UI claims, particularly in 2020 (Figure 2.16).

However, decomposing these total claims into starts and exits reveals significant churn in the population receiving PUA with new workers starting and exiting the PUA program in any given week, even when supplements were available. In other words, one reason for the slower fall in PUA claims is that new workers continued to enter the PUA program, even as others were exiting.

FIGURE 2.17

Exit Rates from Regular Unemployment Insurance and Pandemic Unemployment Assistance Programs, January 2020–August 2021



Source: Greig, Sullivan, and Anderson et al. 2022.

Note: The spikes in exit rates that occur in May for regular UI recipients, and in December for both regular UI and PUA recipients, reflect volatility associated with administrative changes in the program. The May survey coincided with the beginning of PUA: this suggests that some regular UI recipients may have transitioned to PUA. The spikes in the last two weeks of December and the first two weeks of January reflects a surge in exits when PEUC and PUA temporarily lapsed.

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Figure 2.17 compares the exit rate out of regular UI versus PUA throughout the pandemic, which more narrowly homes in on potential work disincentive effects. Notably, the PUA exit rate is slightly lower than the exit rate for regular UI in 2020, but hovers around 5 percent throughout the time when the \$600 supplement was available. Exit rates are comparable between regular UI and PUA recipients in 2021, when the \$300 supplement was available.

One possible account for the slightly higher exit rate among regular UI recipients in 2020 is that, as documented in figure 2.10, recalls accounted for a large share of exits in 2020. Recalls, or job restarts, could disproportionately reflect regular UI recipients whose employers can rehire past employees and who, in theory, have an obligation to accept the recall or risk losing UI

benefits. PUA recipients, in contrast, include a range of different worker types and circumstances, including contingent workers, self-employed workers, and caregivers. Their ability or choice to return to work may lie more in their own hands, and benefit receipt was not subject to third-party verification. Put differently, that so many PUA recipients exited the program signals extraordinary levels of voluntary compliance with PUA eligibility guidelines on the part of claimants.

In summary, PUA dramatically expanded UI eligibility to workers at the margins of the labor force, offsetting meaningful income losses. Although PUA recipients were more likely than regular UI recipients to experience long-term unemployment, UI exit rates were generally comparable between the two programs, even when the supplements were available. This leads to the tentative conclusion that work disincentive effects were not significantly larger for PUA recipients than they were for regular UI recipients. Given the scarcity of data on PUA recipients, these conclusions remain uncertain.

In the next section we discuss administrative challenges, some of which were particularly acute in the PUA program.

Administrative Shortcomings and Red Tape in Serving the Surge in UI Demand Were Costly in Terms of Consumer Welfare and Government Expense

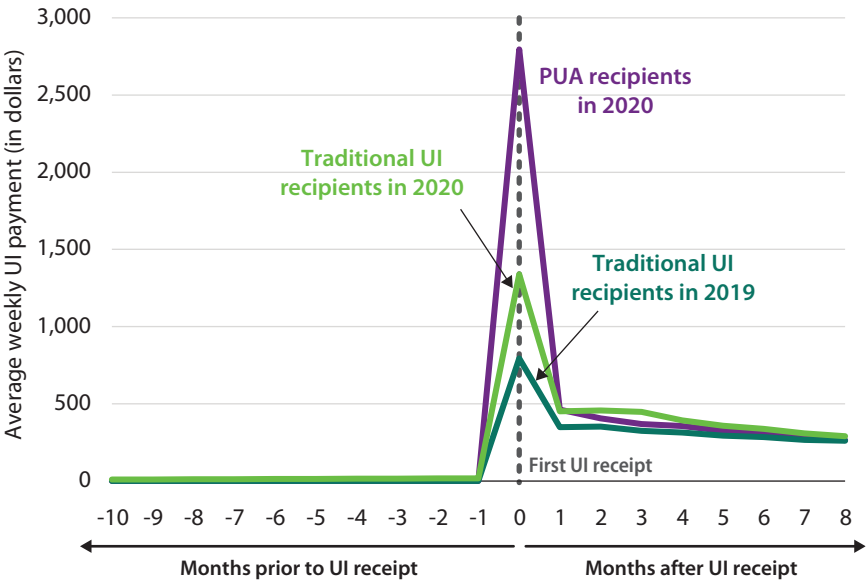
As economists, we tend to focus on the economics of policy but not enough on the plumbing of policy. In a macro sense, the UI plumbing worked well and improved over the course of the pandemic. In 2020 alone, states dispensed \$572 billion in federal and state UI funds to 31 million jobless workers (BEA 2022a; DOL n.d.b). States stood up the entirely new PUA program and began making payments within a month; states typically are given two years to conform to new policies.

That said, a variety of administrative challenges hampered the effectiveness of UI during the pandemic and are costly in terms of consumer welfare. The time to address them is now, when there is less pressure on state UI systems as the U.S. recovers from the recession. We focus on four key administrative issues: delays in UI payments, red tape, disparities in UI reciprocity, and an increase in overpayments.

Issue 1: Delays in UI Payments

There were substantial delays in UI payments. States had to stand up an entirely new program in the case of PUA. DOL's inspector general documents that, from the passage of the CARES Act to the first payment of a claim, it took 38 days for the PUA program and 25 days for the FPUC program (DOL 2021). However,

FIGURE 2.18
Average Weekly Unemployment Insurance Payments Received Around the Week of First UI Receipt, by Program



Source: Greig, Sullivan, and Anderson et al. 2022.

Note: Recipients include those who received any UI payments in or after April 2019 and those who received any UI or PUA payments in 2020.



many UI recipients experienced even longer delays. Novello and Stettner (2020) estimated that the share of initial 2020 claims that had been paid stood at just 14 percent by the end of March, 47 percent by the end of April, and 56 percent by the end of August.

Greig, Sullivan, and Anderson et al. (2022) document payment delays by comparing the size of the first UI payment to subsequent weekly payments (Figure 2.18). From the first payment size, one can infer how many weeks' worth of back pay the worker received in their first benefit payment, indicating how many weeks the worker waited to receive their first payment. In 2019, when the UI system was not overloaded, delays were fairly short, and workers' first UI checks contained roughly two weeks' worth of payments. In 2020, when the UI system was heavily burdened, initial checks had about three weeks' worth of payments. In contrast, the PUA system had much larger initial payments corresponding to delays of six or seven weeks. Bell et al. (2021c) similarly

document significant delays in UI benefit receipt in California, especially for PUA recipients.

These delays were consequential in terms of consumer welfare. As Farrell et al. (2020) show, delays in UI payments created economic hardship for the recipients: workers who had to wait a month longer for their benefits cut their spending by 10 percentage points more than workers who waited less than a month. DOL (2021), summarizing press reports, described the impacts of UI delays on claimants as including an inability to pay bills, increased credit card debt, high interest rate borrowing, depleted savings, food scarcity, and homelessness.

Issue 2: Red Tape

A second issue are administrative seams between different UI programs, or red tape, at the end of claimants' benefit year. Bell et al. (2021c) and Ganong, Greig, Noel, et al. (2021) document a huge surge in UI exits in March and April of 2021, when, in certain states, a large number of UI recipients were reaching the end of their benefit year and had to file a transitional claim in order to continue receiving state UI benefits (Figure 2.19). This suggests that the need to recertify lowered benefit receipt among many eligible workers.

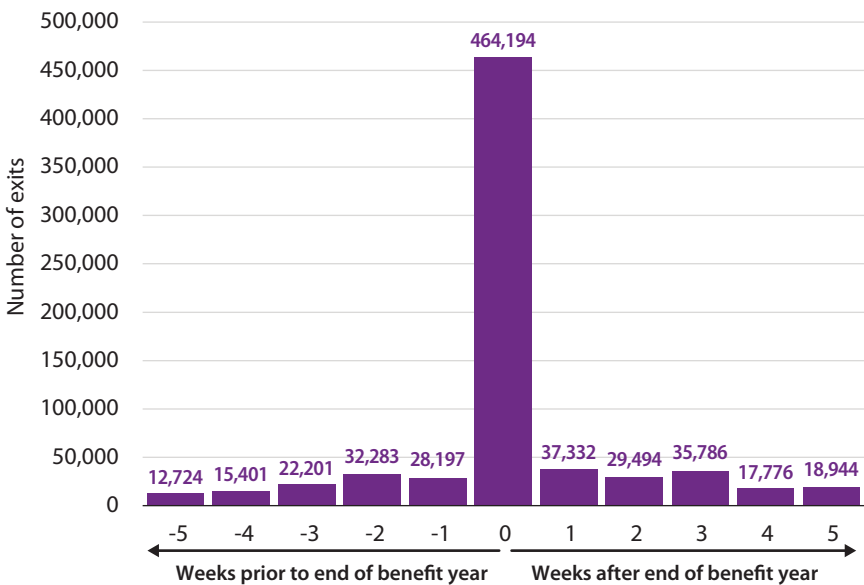
Issue 3: Disparities in UI Reciprocity

A third issue is continued disparities across the states in UI reciprocity rates, or the ratio of the number of UI recipients to the number of unemployed workers. Prior to the pandemic, UI provided coverage to few unemployed workers. In 2019, nationally the UI reciprocity rate stood at just 28 percent, ranging from 59 percent in New Jersey to just 10 percent and 11 percent in North Carolina and Florida, respectively.¹⁵ Low UI reciprocity stems from shorter UI durations (e.g., 13 weeks in Florida during normal times compared to 26 weeks in most states) and more stringent eligibility screens. Reciprocity rates are noticeably lower in states with higher shares of Black populations (Bell et al. 2021d; O'Leary, Spriggs, and Wandner 2021).

During COVID, the share of unemployed workers receiving UI benefits increased dramatically, largely due to extended benefit duration through PEUC and the increase in eligibility through the PUA program. The share of unemployed workers on regular UI (excluding PUA) increased from 28 percent in 2019 to 78 percent in 2020 and 37 percent in 2021 (DOL n.d.d., sec. A.12, A.13). But disparities in access and cross-state variation persisted. Reciprocity rates ranged from 134 percent in Vermont (and more than 100 percent in six other states) to just 42 percent in South Dakota and 44 percent in North Carolina (DOL

15. Data are from the DOL Unemployment Insurance Chartbook (DOL n.d.d., sec. A.12, A.13).

FIGURE 2.19
Number of Claimants Exiting Regular Unemployment Insurance by Number of Weeks Until End of Benefit Year, March 7–May 22, 2021



Source: Bell et al. 2021c.

Note: Includes claimants for Regular UI only, where an exit is defined as the last payment before a gap of two or more weeks without a certification for benefits. Claimants who certify for those weeks retroactively and those who transition into the PUA program are not counted as exits.



n.d.d., sec. A.12, A.13). Reciprocity rates exceeding 100 percent in some states are unsurprising in light of the fact that eligibility for regular UI was expanded to include workers who would normally not be considered unemployed: for example, work search requirements were waived during the pandemic.¹⁶ In addition, partial UI claims, duplicate claims, improper payments, and payments for multiple weeks of benefits could all have contributed to claims exceeding the number of unemployed (Bell et al. 2021d; Cajner et al. 2020).

Disparities in access also remained across socioeconomic categories. Lower-educated, lower-income, and Black workers, communities with less

16. For this reason, Bell et al. (2021d) argue in favor of the more expansive U-6 definition of unemployed in the reciprocity rate denominator.

broadband access, and communities with the youngest and oldest applicants all exhibited lower reciprocity rates (Bell et al. 2021d; Bitler, Hoynes, and Schanzenbach 2020; Carey et al. 2021). Bell et al. (2021d) document that correlations between these demographic characteristics and reciprocity rates or first payment rates did not attenuate during the pandemic, and in some cases worsened. Thus, although reciprocity rates increased dramatically on the whole, it is not clear that the expansions in eligibility and duration improved equity in access to the program across socioeconomic characteristics.

Issue 4: Overpayments

A fourth issue is the increase in UI overpayments, or fraudulent claims, during the pandemic. Prior to the pandemic, according to the DOL (n.d.c.), UI overpayments, administrative errors, and fraud accounted for roughly 10 percent of claims. Applying the 10 percent overpayment rate from prior years, DOL (2022) projected that overpaid claims could ultimately total \$87 billion. However the most recent estimates at [PaymentAccuracy.gov](https://www.paymentaccuracy.gov) suggest that overpayments increased not just in dollar terms but also in percentage terms: the overpayment rate during the pandemic is 18 percent for fiscal year 2021. For the PUA program, DOL data (n.d.d.) similarly indicate an overpayment rate of 19 percent for 2021. A few states are on record reporting larger improper payment rates, for example accounting for as much as 27 percent of benefits paid in Arizona (Christie 2021). Certainly, concerns of fraud appeared frequently in the press and were a salient touchpoint among policymakers (Crapo et al. 2021). The full toll of fraud remains unknown and states will likely continue to find and recover improper payments for some time.

Although 18 percent represents a near doubling of the improper payment rate from pre-pandemic years, 82 percent of claims were paid out correctly. This represents an extraordinary level of voluntary compliance given that, in service of speed, verification activities and requirements were relaxed during the pandemic. In addition, a significant share of overpayments represent a claimant or agency error rather than fraud. As documented by DOL (2021), during the pandemic many states did not perform activities to detect and recover improper payments, such as cross-matching claims with various state and interstate data sets, that would identify new hires, death records, incarcerated individuals, and individuals also benefiting from UI in another state. At the same time, organized crime associated with data breaches and identity theft increased the threat of fraud by foreign groups. In sum, improper payments likely increased due to both weaker agency control activities in the face of peak volume claims and an increase in crime involving identity theft.

Implications for Future UI Policy

COVID-19 led to the largest UI policy experiment since the advent of UI in the 1930s. Prior to the pandemic, regular UI replaced just 50 percent of earnings in most places, and, as evidenced in low reciprocity rates, many unemployed workers did not receive UI benefits. Historically, the primary UI policy response to a recession was to extend the duration of benefits because people might face longer-term unemployment. The COVID-19 pandemic gave policymakers a reason to temporarily set aside concerns of work disincentives and paying people not to work.

What happened when the U.S. gave more people more money, and for longer? UI coverage increased a lot, reaching workers who had historically been left out of the UI system, and boosting the spending of all UI recipients. But there were some comparatively smaller losses in efficiency, in the form of work disincentive effects and UI overpayments. What are the implications of these conclusions for designing policy for the future, even as federal expansions have expired? We highlight two key points. First, UI benefit expansions covered labor income risk not insured by regular UI, warranting consideration of adopting these more permanently or as automatic countercyclical stabilizers. Specifically, we discuss potential approaches to UI supplements and eligibility expansions, the two key expansions that were novel to this pandemic. Second, stronger administrative systems are necessary for delivering timely and accurate UI benefits at scale in a worker-centered, recession-ready way.

UI benefit expansions covered labor income risk not insured by regular UI, warranting consideration of adopting these more permanently or as automatic countercyclical stabilizers.

UI Supplements

With a typical replacement rate of 30–50 percent, regular UI cannot sustain families over extended periods of time. While that rate may be sufficient during normal labor market conditions, temporary supplements might be warranted, especially during recessions when the risk of long-term unemployment is high. Regular UI replacement rates in the U.S. are very low by international standards (Gruber 2005), and arguably offer inadequate income support. As Bell et al. (2021b) document, without benefit supplements, the average weekly benefit of \$332 was just 56 percent of California’s threshold for “Very Low Income.”

Given uncertainty about why work disincentive effects were so much lower during the pandemic than would have been predicted by historical evidence, it could be reasonable to take a conservative approach to supplements. Replacement rates of 60–70 percent would be on par with international standards (Gruber 2005). Supplements could be adjusted according to labor market conditions: UI replacement rates could be set higher during the trough of a recession while labor demand is low, as a means of boosting consumption, and then

tapered as labor demand recovers. This has the added advantage of allowing for geographic specificity in supplement levels, insofar as labor market conditions and recovery trajectories can vary widely across regions.

How should supplements be structured? Should they be flat or tailored to a target income replacement rate? Although flat supplements were highly progressive, flexible supplements that target a replacement rate below 100 percent likely create fewer inefficiencies in terms of work disincentive effects, which were larger among lower-income workers during the pandemic. In addition, flexible supplements below 100 percent replacement offer greater horizontal equity by ensuring that UI recipients are not better off than similarly paid employed workers. In addition, they could target replacement rates that differ not only over time but also across income groups, as proposed by Dube (2021). As we discuss below, flexible supplements require a stronger IT and administrative backend, which is therefore necessary for sound UI policy.

Eligibility Expansions

PUA mitigated labor income risk for workers who were more marginally attached to the labor force, with no clear evidence of increased work disincentive effects. This potentially warrants UI reform to broaden eligibility more permanently or to create a second-tier level of income support for unattached workers. For example, others have advocated expanding eligibility to workers with part-time, seasonal, or otherwise low or volatile incomes (Dube 2021; Furman 2016). The proliferation of more-modern means of verifying income streams (e.g., apps like Earnin that provide early access to wages prior to payday) could make these eligibility expansions more technically feasible.

Conceptually, versions of these programs already exist. During COVID, the share of UI beneficiaries receiving partial UI benefits increased to almost 20 percent in California (Bell et al. 2020a).¹⁷ One way to expand eligibility is to relax pre-unemployment earnings requirements for UI or to increase the amount of income that is disregarded when calculating partial UI weekly benefit amounts, as advocated by Hedin, Schnorr, and von Wachter (2020). One caveat, however, is that simply relaxing earnings requirements could have the effect of increasing benefit levels without meaningfully increasing the number of people who receive benefits. Thus, a true expansion of eligibility in terms of the categories of workers who are eligible might still be needed to replicate the expanded coverage achieved through the PUA program.

The COVID-19 virus and its impacts on the availability of care also made other good cause circumstances—such as a health event and caring for dependents—more salient as part of a potentially more enduring UI eligibility

17. Workers earning less than three quarters of their prior weekly wages due to reduced hours qualify for partial UI.

framework. For example, the Omicron surge in January 2022 resulted in disruptions in care, widespread quarantines, and a return of virtual school or school cancellations. According to the Census Household Pulse Survey, the number of families who reported not working due to having COVID-19 or caring for someone with COVID-19 increased from 3 million in the first half of December 2021 to more than 8 million between December 29, 2021, and January 10, 2022 (U.S. Census Bureau n.d.). With PUA no longer in place in 2022, however, workers had no means of receiving income support if they lost income as a result of these circumstances.

A key challenge that states faced during the pandemic is that they were standing up an entirely new program amid peak claims volume. Thus, keeping a permanent version of PUA has the added important benefit of allowing states time to establish protocols and enhance systems to accommodate other populations of uncovered workers in non-peak times.

Stronger administrative systems are necessary for delivering timely and accurate UI benefits at scale in a worker-centered, recession-ready way. In UI administration, there is always a trade-off between speed and accuracy. If a UI agency approves all claims immediately, then there will be a high rate of overpayment and fraud. However, if a UI agency spends a long time checking every claim, then legitimate UI claimants will not be able to access their benefits when they need them most. In an economic downturn, this trade-off is even more acute: UI plays a key fiscal stimulus role, and its ability to deliver vast sums of relief quickly is critical to mitigating a recession. Yet states faced delays in processing the enormous surge in UI claims and standing up the new PUA program. In response, many states relaxed third-party verification, resulting in an increase in improper payments.

This trade-off between speed and accuracy does not have to exist. Investment in technology can expand the frontier of what is possible, enabling states to be more accurate in making payments at a given speed or to make payments faster while maintaining accuracy. States need to approach their UI delivery infrastructure as if it were economic disaster preparedness, much the same way FEMA plans for aid delivery during a hurricane. In fact, the federal government helps with natural disaster response by providing not just funding, but also operational and delivery support. As such it seems reasonable for the federal government to play a more active role in responding to labor market disasters, rather than relying on states to prepare and respond on their own. The fact that FEMA money was enlisted to pay for temporary \$300 supplements in the fall of 2020 could serve as a potentially helpful precedent for more federal intervention and support. This is a way for the federal government to quickly authorize additional funding through executive orders when legislative action might take longer.

More generally, the federal government could provide a technology and data infrastructure that could enable not only flexible benefit levels set at a target income replacement rate but also stronger, more seamless eligibility

verification and fraud prevention. Specifically, as proposed by Dube (2021), the federal government could use available earnings data from both UI applicants and employer earnings data to automatically calculate benefit levels. As Simon-Mishel et al. (2020) document, fewer than half of states have modernized their UI systems. The COVID-19 crisis laid bare the consequences of these antiquated systems, which were a critical barrier to implementing a benefit supplement tied to prior earnings. During the pandemic the DOL's inspector general, in its recommendations to reduce overpayments and fraud, advised state agencies to join and cross-check a number of data exchanges, but many states did not. Arguably the federal government could play a stronger role in cross-checking and third-party verification.

Modernization efforts are under way. The American Rescue Plan provided grant funding to states to partake in modernization efforts, and DOL is actively working with states and law enforcement agencies to prevent and counter fraud.

Further research is required to design optimal UI policy and administration, and there are still many open questions. For example, how much should optimal UI replacement rates and durations vary with underlying economic conditions? How do work and spending responses to changes in UI depend on expectations about the persistence of these changes? What can we learn from temporary policy changes when contemplating the effects of more-permanent changes to the UI system? How might agencies verify prior wages and income losses among self-employed individuals to determine eligibility and prevent fraud? Finally, which aspects of UI should be made permanent as a counter-cyclical automatic stabilizer versus leaving some aspects to legislative action?

The COVID-19 recession underscored the importance of answering such questions.

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Lessons Learned from Economic Impact Payments during COVID-19

Michael Gelman and Melvin Stephens Jr.¹

Introduction

The pandemic-induced recession that began in March 2020 led to a multitude of public health and economic policy responses from the U.S. federal government. Some, such as the Paycheck Protection Program, were novel. Others were familiar, including extending the duration of unemployment benefits and providing direct payments to households. Across three rounds spread over less than one year, more than \$800 billion in cash was distributed to households in the form of Economic Impact Payments (EIPs; also known as stimulus checks or payments).

This chapter discusses the lessons learned from the distribution of EIPs that can be applied to future recessions—including whether EIPs are an effective way to aid households who lose income in a downturn. The chapter begins by reviewing the structure of earlier tax rebate and economic stimulus payments, which were the precursors to the EIPs, followed by a discussion of the parameters of the EIPs. Next, we cover the demographic composition and economic status of EIP recipients, the timing of EIP receipt, and the extent to which EIP benefits helped offset income losses using data from the U.S. Census Bureau's Household Pulse Survey. The chapter then surveys the research that analyzes the impact of EIPs on household spending and compares the findings to the literature that examines how household spending was impacted by the prior payments. The final section turns to the lessons learned from this round of stimulus payments that can be applied to subsequent economic downturns.

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Federal Rebate and Stimulus Payments

The onset of the COVID-19 pandemic in early 2020 led to numerous actions designed to protect public health and curb the spread of the disease, such as firms shifting to remote work and governments imposing stay-at-home orders, which coincided with a sharp decline in economic activity. Although novel factors contributed to this economic downturn, the federal government once again deployed the use of direct stimulus payments to combat a recession. The Coronavirus Aid, Relief, and Economic Security (CARES) Act, signed on March 27, 2020, mandated one-time stimulus payments as part of a broader package of fiscal measures constructed to address the economic challenges faced by households.

While the CARES Act marks the fourth time since 2001 that the U.S. government has provided direct payments to households, the use of this fiscal policy lever pre-dates the 21st century.² The Tax Reduction Act of 1975 (TRA 1975), signed into law on March 29, 1975, after the unemployment rate had risen nearly 3 percentage points in the prior 12 months, was intended to jumpstart an economic turnaround (Romer and Romer 2010). The law provided tax rebates to all taxpayers on income earned in 1974, ranging from \$100 to \$200 depending on the tax unit's adjusted gross income (AGI) (Internal Revenue Service 1975).³ These rebate checks were disbursed by mail, primarily in May and June 1975.

Rebates were issued again following the signing of the Economic Growth and Tax Relief Reconciliation Act (EGTRRA 2001) on June 7, 2001. The Act lowered the marginal tax rate in the lowest tax bracket retroactively, to the beginning of 2001, and provided an immediate rebate to all taxpayers who filed returns for the 2000 tax year. While rebates were not originally part of the Act, concerns about an economic downturn led to the inclusion of these payments to immediately stimulate the economy (Romer and Romer 2009). The rebate amount was \$300, \$500, or \$600 depending on the taxpayer's filing status (single, head of household, or married, respectively).⁴ The checks were delivered by mail and the vast majority were received in July, August, and September 2001, with the disbursement date determined by the tax filer's Social Security number.

The Jobs and Growth Tax Relief Reconciliation Act (JCTRRRA 2003), signed on May 28, 2003, included a temporary \$400 increase in the Child Tax Credit for 2003 and 2004. Romer and Romer (2009) note that although there were

2. We focus our discussion on stimulus payments from the U.S. federal government. Some U.S. state governments have issued rebates, as discussed by Heim (2007).

3. Social Security recipients each received \$50 payments, as Social Security benefits were not taxed by the federal government at this time. The 1975 act also increased the standard deduction and provided a tax credit for each taxpayer and dependent for the 1975 tax year only.

4. Those filers who earned less than the top income threshold for the first tax bracket received a proportionately smaller rebate. Johnson, Parker, and Souleles (2006) provide an overview of the EGTRRA 2001 legislation.

immediate economic concerns that motivated the design of the Act, the changes to the tax credit were intended to be made permanent. The law called for the \$400 increase for 2003 to be paid in advance, based on information provided in the 2002 tax return, which resulted in checks being mailed to 24 million households over a three-week period from July 25 to August 8, 2003.⁵ The timing of check distribution was again based on the tax filer's Social Security number.

Payments included in the Economic Stimulus Act (ESA 2008), signed on February 23, 2008, were intended, as stated in the text of the legislation, “to provide economic stimulus through recovery rebates to individuals.”⁶ The Act, which provided substantially larger payments than in prior legislation, called for \$600 payments to singles, \$1,200 payments to married couples, and an additional \$300 for each qualifying child.⁷ These benefits were based on 2007 tax returns and were disbursed electronically—for the first time ever—in the first weeks of May 2008 to those who had provided the Internal Revenue Service (IRS) with bank account information to receive a tax refund. The bulk of the remaining payments were delivered as checks through the mail from mid-May through early July.

Table 3.1 compares the features of the previous U.S. federal rebate/stimulus payments. While the TRA 1975 used a single formula to determine the payment amount regardless of marital status, the formulas for the remaining payments were based on filing status (single vs. married).⁸ The JGTRRA 2003 and ESA 2008 payments both differed from the TRA 1975 and EGTRRA 2001 payments in that they were phased out at higher income levels.⁹ Whereas the JGTRRA 2003 temporarily increased the existing Child Tax Credit, the ESA 2008 payments included, for the first time, higher benefit amounts for each qualifying child in the household. To compare the payment amounts over time, the final column of Table 3.1 shows the benefit amount for a family of four (married couple with two qualifying children) as a share of median monthly income for a four-person household.¹⁰ This share is roughly constant across the first three stimulus episodes before nearly doubling with ESA 2008.

5. Johnson, Parker, and Souleles (2009) provide an overview of the JGTRRA 2003 legislation. Crandall-Hollick (2021) provides legislative details of Child Tax Credit changes over time. Although called a “tax credit,” these credits were already refundable by the time of the JGTRRA 2003 legislation.

6. See Economic Stimulus Act of 2008, Pub L. No. 110-185.

7. Parker et al. (2013) provided an overview of the ESA 2008 legislation.

8. Although “head of household” is another filing status that is used to determine benefits, we have omitted this information for expositional purposes.

9. The phaseout of the Child Tax Credit payments as part of JGTRRA 2003 resulted from the Child Tax Credit itself already being phased out for higher income tax filers as opposed to being an addition to the JGTRRA 2003 legislation.

10. The payment amount in the numerator of the share is the base stimulus payment amount for a married filer plus the additional amount, if applicable, for both qualifying children. For 1975, the payment amount used in this calculation is \$200, as the median annual income for a four-person household in 1975 was \$15,849. The median annual income for a four-person

TABLE 3.1

U.S. Federal Stimulus Payments

Legislation	Base Amount		Additional Per-Child Amount	Phaseout Region Begins		Payment Share of Monthly Income
	Single	Married		Single	Married	
Tax Reduction Act (1975)	\$100 to \$200					15%
Economic Growth and Tax Relief Reconciliation Act (2001)	\$300	\$600				12%
Jobs and Growth Tax Relief Reconciliation Act (2003)			\$400	\$75,000	\$110,500	15%
Economic Stimulus Act (2008)	\$600	\$1,200	\$300	\$75,000	\$150,000	29%
Economic Impact Payment Round 1	\$1,200	\$2,400	\$500	\$75,000	\$150,000	38%
Economic Impact Payment Round 2	\$600	\$1,200	\$600	\$75,000	\$150,000	27%
Economic Impact Payment Round 3	\$1,400	\$2,800	\$1,400	\$75,000	\$150,000	63%

Source: Internal Revenue Service 1975, 2020a, 2020b, and 2021; Johnson, Parker, and Souleles 2006 and 2009; Parker et al. 2013; U.S. Census Bureau 2020; authors' calculations.

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Note: Base amounts shown in column (1) are for single and married tax filers, respectively, except for the Tax Reduction Act of 1975, where the same payment scheme is applied to both single and married households: the highest amount was paid to households under \$20,000 AGI and the lowest amount was paid to households with over \$30,000 AGI. Column (2) shows the increase in the payment per child, where applicable. Column (3) shows the Adjusted Gross Income amount at which the phaseout region begins, where applicable, for single and married tax filers, respectively. Column (4) shows authors' calculations of the payment as a share of median monthly income for a household with married parents and two qualifying children.

Direct Payments to Households During the Pandemic

Whereas previous direct payments to households were designed to counteract slumping aggregate demand, the initial round of EIPs was publicly discussed as a form of insurance. For example, Senator Mitt Romney said, “While expansions of paid leave, Unemployment Insurance, and SNAP benefits are crucial, the check will help fill the gaps for Americans that may not quickly navigate different government options (Higgins and Mangan 2020).” In contrast to other social insurance programs, the EIPs did not require the majority of households to submit any new paperwork and hence had a higher chance of uptake conditional on eligibility. In addition, the historic rise in Unemployment Insurance (UI) claims caused many state UI systems to be overwhelmed leading to numerous delays in UI receipt. Furthermore, school closures and adverse

household used in these calculations was produced by the Census Bureau using data from the March Current Population Survey and can be found on the U.S. Census Bureau website.

health events affected the ability of some individuals to work who could not avail themselves of existing insurance programs. As discussed below, the EIPs were rapidly distributed to most households, which provided an immediate source of income support for many households, particularly those that applied and were still waiting for benefits from other government programs.

The EIPs were also widely seen as a way for Americans to maintain their ability to buy necessities. Then-Senator Kamala Harris called for “emergency cash” for families, which implies they would use the money for bills and necessities rather than discretionary spending. Michael R. Strain and Scott Gottlieb (2020) wrote an opinion piece arguing that rebate checks should be targeted to low-income households in places with severe outbreaks. They maintained that such rebate checks would allow hourly wage workers to stay home if they were sick, which would help contain the spread of COVID-19.

There were three rounds of EIPs issued to households in response to the COVID-19 pandemic. The first EIP was mandated in late March 2020 by the CARES Act (Internal Revenue Service 2020a). It included \$300 billion in cash payments as refundable credits against 2020 personal income taxes for eligible individuals. Married couples with an AGI of less than \$150,000 received \$2,400 while unmarried individuals with an AGI of less than \$75,000 received \$1,200. Benefits were increased by \$500 for each qualifying child (under age 17). EIP benefits were reduced if a household’s AGI exceeded its corresponding threshold. The benefit reduction rate was 5 percent. In other words, each \$1,000 in AGI above the threshold lowered the EIP by \$50.¹¹ For those who had filed tax returns in 2018 or 2019, the information from the tax returns was used to automatically distribute payments based on the aforementioned benefit formulas. For those who had not filed tax returns, payments were still received automatically if the individual received benefits through certain federal programs.¹² Individuals could also request an EIP through the IRS website. Payments were first made via direct deposit on April 15, 2020, with roughly 50 percent of all EIPs being delivered by mid-April and nearly 90 percent being delivered by early June (Murphy 2021). Delivery of EIPs through other means (paper check and debit cards) began soon after.

The second EIP was mandated by the Coronavirus Response and Relief Supplemental Appropriations Act, which was signed on December 21, 2020, and included \$166 billion in cash payments. The base amounts were half the size of those in the first EIP round while the payment for each qualifying child

11. Given this benefit reduction rule, married households that had no qualifying children did not receive an EIP if their AGI exceeded \$198,000 while the corresponding cutoff for households with two qualifying children was \$218,000. For unmarried households, the AGI cutoff with no qualifying children was \$99,000 while the cutoff with two qualifying children was \$119,000.

12. Automatic payments were made to recipients of Social Security, Supplemental Security Income, Railroad Retirement, or Veterans Administration pension benefits.

increased from \$500 to \$600. The phaseout regions and benefit reduction rate did not change. Automatic payments were made to those who had filed 2019 tax returns, were beneficiaries of certain federal programs (as with the first round of EIP payments), or were registered for the first round EIP payment. Payments were first made via direct deposit starting December 29, 2020, with the delivery of paper checks and debit cards starting soon after (Internal Revenue Service 2020b).

The third EIP, which totaled \$400 billion in stimulus payments, was mandated by the American Rescue Plan Act, which was signed on March 11, 2021. The base amounts were slightly higher than in the first round of payments, equaling \$1,400 for single filers and \$2,800 for married filers. Households also received \$1,400 for each qualifying dependent, whereas in prior EIP cycles the additional amounts were limited to children under the age of 17. EIP payments to single households again began to be phased out at \$75,000, but in this round, these were entirely phased out for those with an AGI above \$80,000 regardless of the number of dependents. For married households, the phaseout began at \$150,000 and was entirely phased out above \$160,000. Automatic payments were made to those who had filed 2019 or 2020 tax returns, were beneficiaries of certain federal programs (as with the earlier rounds of EIP payments), or were registered for the first round EIP payment. Payments were first made via direct deposit starting March 12, 2021, with paper checks and debit cards being delivered in the following weeks (Internal Revenue Service 2021).

The three EIP payments differ from earlier rebate and stimulus payments in several respects. First, as shown in Table 3.1, the EIP amounts were a lot larger. Over a period of less than one year, a family of four with income less than \$150,000 received \$11,400, compared to just \$1,800 in 2008. Second, EIP eligibility did not have minimum income requirements based on tax filings which opened up payments to additional low-income households. Third, the EIP payments were distributed very soon after the legislation was signed, beginning the next day in the case of the last round of EIP payments, whereas past stimulus payments took several weeks to reach households, since paper checks were printed and then distributed through the mail. However, there is an important caveat related to the speed with which checks were distributed. Households did not automatically receive the EIP if they did not have current bank account information on file with the IRS, which occurred for households that did not need to file taxes, did not need to provide account information when filing (e.g., for households that did not receive refunds), or had a temporary account set up by a tax preparer that was closed after their refund was received (Holtzblatt and Karpman 2020). Due to the need to claim their EIP benefit (and even become aware of these requirements), households sometimes had to wait several weeks before receiving EIP payments, if they even applied for them.

Who Received the Economic Impact Payments?

The U.S. Census Bureau's Household Pulse Survey (HPS) provides some insight into the demographic composition and economic situation of households that received an EIP.¹³ The HPS was “designed to meet the goal of accurate and timely weekly estimates” of how American households were experiencing the pandemic (Fields et al. 2020). The first phase of the HPS was in the field between April 23 and July 21, 2020, while subsequent phases covered most weeks between August 19, 2020 through early 2022.

The HPS was designed “to accommodate anticipated lower response rates and still produce estimates at the state level as well as for 15 metropolitan statistical areas (Fields et al. 2020).” Thus, the available data has large samples with typically over 50,000 respondents despite the survey response rates being rather low. The first phase of the HPS (weeks 1–12) had weighted response rates that averaged roughly 3 percent. The response rates were higher for the second phase (weeks 13–17), averaging around 9 percent, and declined roughly to 6.5 percent through October 2021 (weeks 18–39). We use survey weights in our analysis that can account for low response rates with regard to observable characteristics. To our knowledge, there are no studies to date addressing whether the low response rates impact findings using the HPS data due to selection into the survey for unobservable reasons. Nonetheless, readers should be mindful of the HPS response rates when interpreting the results using the HPS presented below.

The HPS only collects demographic and labor market status information from an adult respondent, not the entire household. While some questions refer to the entire household, such as total annual income during the past calendar year and EIP reciprocity, the HPS only provides a limited picture of the household demographic and economic situation.

Retrospective questions regarding whether households in the HPS had received payments from the first round of the EIP appeared between June 11 and July 21, 2020 (weeks 7–12 of the HPS). Respondents were asked whether they or anyone in the household had received or planned to receive the EIP (first round) and, if so, whether they had already or planned to use the EIP mostly to pay for expenses, mostly to pay off debt, or mostly to add to savings. The data do not allow us to distinguish between those who had already received an EIP and those who planned to receive an EIP. However, Murphy (2021) notes that almost 90 percent of EIPs were received by early June 2020, so most of those giving an affirmative response to the EIP receipt question

13. Fields et al. (2020) provide a detailed description of the design and implementation of the HPS, including information about the sampling frame, questionnaire construction, editing and imputation procedures, and so on. The background information on the HPS found in this section is based on the discussion in Fields et al. (2020).

during this phase of the HPS would have already received their EIP. When similar questions reappeared on the HPS between January 6 and July 5, 2021 (weeks 22–33), with regard to the second and third round of EIPs, the question was worded differently: it only asked about receiving the EIP during the last seven days, which complicates the study of EIP reciprocity. Thus, we limit our examination to the first round of EIP payments.¹⁴

Eighty-six percent of HPS respondents interviewed between June 11 and July 21, 2020 reported either having received or expecting to receive an EIP.¹⁵ Of those entitled to the full EIP payment based on 2019 income (less than \$150,000 for couples and \$75,000 for singles), 93 percent reported receiving or anticipating receiving it. To examine the variation in reciprocity by income, Table 3.2 shows outcomes based on calendar year 2019 household income for currently married respondents. Results for single respondents—not shown—tell a similar story.¹⁶

The results in column 1 of Table 3.2 are broadly consistent with the program parameters: very high rates of receipt reported for married couples with less than \$200,000 in 2019 income with much lower rates for households with incomes above \$200,000. The finding that some households with incomes in the above \$200,000 category reported receiving the EIP may be due to multiple reasons. First, while the EIP benefit phaseout region ends for married households with no qualifying children at an AGI of \$198,000, each qualifying child raises the endpoint of the phaseout region by \$10,000. Second, a household's AGI, which is used to determine EIP eligibility, can differ from the total income measure used in Table 3.2 through an array of deductions (e.g., student loan interest payments, alimony, retirement account contributions, etc.) that make AGI fall below total household income. Third, it is well-known that there is some degree of error found in survey reports of earnings and income that may lead some individuals to be incorrectly categorized in this highest income group.

14. Beginning on June 11, 2020 (week 7), the HPS has consistently asked respondents, “Which of the following did you use to meet your spending needs in the last seven days?” EIP has been on the possible listed responses to this question. However, responses to this question also do not allow us to clearly delineate between those who did and did not receive (or plan to receive) an EIP.

15. This share is higher than the 70 percent reciprocity rate reported by Holtzblatt and Karpman (2020) using the first wave of the Coronavirus Tracking Study; however, their figure only includes those who received benefits as of late May 2020 and does not capture future expected (first round) EIP payments. Their sample is also limited to those between ages 18 and 64 with income less than 600% of poverty. If we examine a similar population in the HPS, we find 91 percent reported either having received or expecting to receive an EIP as of July 21.

16. Over 13 percent of the weighted HPS respondents did not provide an answer to the categorical total household income question during this period. These respondents are excluded from Table 3.2.

TABLE 3.2

EIP Reciprocity, Economic Shocks, and Spending Sources, by Income among Married Respondents

Total Household Income (2019)	Share of Household That...		Share Using Listed Source to Meet Spending Needs			
	Received EIP	Lost Employment Income	Regular Source of Income, Like Received Pre-Pandemic	UI Benefits	Borrow from Friends or Family	EIP Benefits
Less than \$25,000	89%	58%	51%	13%	25%	30%
\$25,000 to \$34,999	93%	53%	62%	14%	14%	29%
\$35,000 to \$49,999	95%	49%	71%	15%	10%	25%
\$50,000 to \$74,999	95%	47%	77%	13%	6%	24%
\$75,000 to \$99,999	95%	44%	82%	13%	4%	20%
\$100,000 to \$149,999	93%	39%	87%	10%	2%	16%
\$150,000 to \$199,999	77%	33%	89%	8%	1%	10%
Over \$200,000	23%	28%	93%	4%	1%	3%

Source: U.S. Census Bureau Household Pulse Survey n.d.; authors' calculations.

Note: Tabulations using Household Pulse Survey for weeks June 11 through June 21, 2020.



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Households in the lowest income group were less likely to have received an EIP, or to anticipate receiving an EIP, than EIP-eligible higher income households. Holtzblatt and Karpman (2020) provide additional insight into those who did not receive an EIP as of late May 2020. They found that nearly 40 percent of those not receiving an EIP did not file taxes or receive Social Security benefits. This figure rose to nearly 50 percent when they focused on households below the federal poverty line. In terms of the means to receive such payments electronically, Holtzblatt and Karpman found that 40 percent of nonrecipients and 50 percent of nonrecipients under the poverty line did not have bank accounts. As a result, while many higher income families received their EIPs quite rapidly, a substantial share of low-income households were required to take additional steps before they could ultimately obtain their EIP benefits. Even by mid-September 2020, roughly nine million eligible individuals had still not received an EIP (Government Accountability Office 2020).¹⁷

17. Eligibility for the EIP was impacted for those living in households with unauthorized immigrants. U.S. citizens who jointly filed taxes with someone who did not have a Social Security number but instead had an IRS Individual Tax Identification number were ineligible for the EIP. Chishti and Bolter (2020) estimate that this restriction rendered 5.1 million U.S. citizens and green card holders ineligible for the EIP. These restrictions were relaxed to some extent

Marr et al. (2020) further examined the composition of those eligible for but not automatically receiving EIP payments. Using data from the Census Bureau's Current Population Survey, they estimated that roughly 12 million individuals did not automatically receive EIPs, because they were non-filers and did not receive benefits from a federal program that entitled them to automatically receive an EIP.¹⁸ Based on modelling government benefit reciprocity, Marr et al. found that 75 percent of these individuals were enrolled in either Medicaid or the Supplemental Nutrition Assistance Program (SNAP; formerly the Food Stamp Program) and had disproportionately low levels of education and were disproportionately non-white. They argue that leveraging state and local agencies that administer these benefit programs could provide a faster path for delivering EIP benefits to households that are not automatically receiving their EIP benefits.

EIP benefits were broadly targeted with eligibility based solely on income and family structure. Such widespread availability seems appropriate if a large fraction of the population was affected economically by the pandemic, because EIPs are an efficient and quick source of support for households. The HPS includes a question that can shed light on this issue. In particular, it asks "Have you, or has anyone in your household, experienced a loss of employment income since March 13, 2020?"¹⁹ As shown in the second column of Table 3.2, roughly 60 percent of the lowest-income households reported themselves or someone in their household suffering a loss of employment income in the four to five months following the onset of the pandemic. While the likelihood of suffering a loss of employment income decreased as household income increased (based on 2019 income), a little more than a quarter of the highest income married-couple households reported the recent loss of employment income. Overall, the share of respondents reporting having experienced a loss of employment income was 45 percent.

Another indication that the first round of EIPs served as an important source of relief is that households who reported suffering an income loss were more likely to spend their EIP. Among households reporting at least \$100,000 in income that received an EIP, roughly 15 percent of those who experienced an income loss reported mostly saving the EIP while around 35 percent of those who did not experience a loss reported mostly saving the EIP.

for the second round EIP and allowed some families to retroactively apply for the first round EIP (Murphy 2021).

18. Over 26 million non-filers who received Social Security, Supplemental Security Income, Railroad Retirement, or Veterans Administration pension benefits automatically received their EIP due to coordination between the IRS and the federal agencies that oversee their benefits (Murphy 2021).

19. The wording of this question was changed roughly one year later, beginning April 14, 2021, to "Have you, or has anyone in your household, experienced a loss of employment income in the last 4 weeks?"

The differences persist but are less stark for households in the lowest income group, where the corresponding shares reporting that they mostly saved the EIP was less than 2 percent for those who experienced an income loss and less than 7 percent for those who did not.

Of course, many people who suffered employment losses were also eligible for Unemployment Insurance. However, only about one quarter of the labor force actually experienced a spell of unemployment from March to July of 2020, suggesting that many people experienced income losses without being unemployed (for example, from loss of hours or tips).²⁰ Furthermore, as noted in Chapter 2 of this volume, there were significant delays in processing UI claims at the beginning of the pandemic, and the EIPs likely helped support families who would otherwise have faced significant financial distress. Lastly, early in the pandemic the EIPs likely acted as a form of insurance for recipients who hadn't yet suffered any income loss but faced enormous uncertainty.

Administrative data are another source of information on the efficacy of EIPs at addressing earnings losses during the pandemic. Larrimore, Mortenson, and Splinter (2021) combined earnings information from W2s available to the IRS along with administrative reports of UI benefit receipt and EIP receipt to examine the extent to which these government transfers helped households offset lost earnings during the pandemic. They found that between 2019 and 2020, one-third of tax filers suffered a decline in earnings of at least 10 percent, which they define as a large earnings loss. This share of large earnings losses was the same as was found during the first year of the Great Recession and was a marked increase from the comparable 25 percent figure between 2018 and 2019. When measuring earnings instead as the sum of W2 earnings plus UI benefits, this number falls from 33 percent to 24 percent, indicating an important role for UI benefits in offsetting pandemic income losses. Notably, when EIP benefits are also included as earnings, the share suffering large earnings losses declines further to 19 percent.²¹

The impact of EIP and UI benefits in offsetting earnings losses varied greatly across the earnings distribution. Larrimore, Mortenson, and Splinter (2021) found that 22 percent of tax filers in the highest 2019 earnings quintile suffered large earnings losses. UI benefits and EIP payments only lower this share by one percentage point each. In the lowest earnings quintile, where 51 percent suffered large earnings losses, these benefits played a much larger role. After adjusting for UI benefits, the share with a large loss falls to 37 percent, and after adjusting for the combination of UI and EIP payments, they find that 25 percent were impacted by large losses. As a point of comparison, they noted that UI benefits had essentially no role in reducing the share in

20. Authors' calculations from the Current Population Survey.

21. As another point of comparison, Larrimore, Mortenson, and Splinter (2021) found that 26 percent of filers report declines of 10 percent or more in income from earnings and UI combined.

the bottom quintile suffering large earnings losses during the first year of the Great Recession (when 48 percent in the bottom quintile experienced a large earnings loss) or in 2019 (42 percent).²²

These results indicate that EIP and UI benefits helped offset earnings losses for many households at the onset of the pandemic. Of course, households may have relied on a number of income sources during the pandemic. The HPS asks respondents, “Thinking about your experience in the last 7 days, which of the following did you use to meet your spending needs?” Households could select one or more responses from a list of potential income sources. A few months into the pandemic, when the HPS data used in Table 3.2 were collected (June 11 and July 21, 2020), the vast majority of households in the highest income group relied on regular income similar to pre-pandemic sources (column 3).

What sources of income did relatively low-income households rely on in the early months (June and July 2020) following the onset of the pandemic? Roughly one in seven households relied on UI benefits during this period across all but the highest income groups (column 4). The lowest-income households were the most likely to rely on borrowing from friends and family, with over one-quarter of these households doing so (column 5). Interestingly, two to three months after the first EIP began distribution, nearly one-third of the lowest-income households reported relying on the EIP to meet their spending needs (column 6), consistent with the particular importance of EIP benefits to the lowest-income households, as found in the IRS data. Consistent with the Larrimore, Mortenson, and Splinter (2021) results, these findings highlight the importance of the EIP payments in addressing the needs of the lowest-income households.

Other aspects of the social safety net were expanded by Congress in response to the pandemic (Bitler, Hoynes, and Schanzenbach 2020; Moffitt and Ziliak 2020). One change was to increase—for states that chose to participate—a household’s monthly SNAP benefit to the maximum monthly amount based on the household’s size. Another change was the creation of the Pandemic Electronic Benefit Transfer (P-EBT), which provided benefits to those families with children who would have received free or reduced-price school meals if schools had remained open. Rental assistance and Medicaid spending also increased during the pandemic.

Understanding the interaction between EIP payments and these additional programs is quite important. Given the broad set of households that received EIP benefits, many of those that were eligible for these other programs were also eligible to receive an EIP, thus providing an additional income source to the

22. Larrimore, Mortenson, and Splinter (2021) found that 42 percent of those suffering large earnings losses received UI benefits in 2020, a large increase relative to the first year of the Great Recession (27 percent) and a dramatic increase from the prior calendar year (9 percent).

most vulnerable households.²³ At the same time, the breadth of EIP eligibility also may have played an important role in supporting households that did not immediately apply for other benefits or had difficulty obtaining other benefits. Moreover, EIP payments may have proven to be quite beneficial to households that fell through holes in the social safety net (e.g., those finding themselves ineligible for standard benefit programs due to their limited work history).

Overall, the findings discussed in this section show that the first round of EIP payments contributed to combatting pandemic-induced earnings losses, especially among low-income households. Although payments were broadly distributed, they addressed what appears to be widespread need. However, the EIPs were slow to get to many eligible low-income households whose incomes were disproportionately impacted in 2020. An important area for additional study is whether EIP payments benefitted households that fell through the holes in the social safety net, i.e., those who could not obtain benefits from other social programs, or at least could not do so in a timely manner.

The Consumption Response to the EIP Payments

There is a burgeoning literature examining the consumption impact of EIP benefits. Most studies estimate the marginal propensity to consume (MPC), i.e. the share of the increase in income that is spent by the household. Research investigating the consumption response to the EIPs can broadly be divided into two groups based on the type of data used in the analysis. The first group used bank and credit card transaction data that can be aggregated across time to form a measure of spending for different time periods ranging from daily to monthly. The second group leveraged self-reported survey data where households are asked about spending over a fixed time horizon or about broad categories of use for their EIP (e.g., spend, save, pay off debt).

Table 3.3 provides a summary of the papers discussed in this section that examine the spending response to the EIP payments. Comparing MPC estimates across these studies is challenging due to differences in the types of data used (transactions vs. survey data), differences in sample composition, and differences in the empirical specifications employed. Comparisons to the prior literature that examined the MPC of earlier rebate episodes are also difficult for related reasons. We discuss several of these issues below in our review of this literature.

23. However, as we discussed above, a significant share of these households may not have automatically received an EIP payment.

TABLE 3.3

EIP Response Study Summary

Study	Data Source	EIP Round	MPC	MPC Reference Period	Notes
Baker et al. (2020)	Fintech bank account (SaverLife)	1	0.25–0.40	Two weeks	Lower income sample. Those with lower incomes, greater income drops, and less liquidity show largest responses.
Boutros (2020)	Household Pulse survey	1	NA	NA	Almost 75% of households receiving an EIP reported using it to mostly pay for expenses.
Chetty et al. (2020)	Various administrative Fintech sources	1	NA	NA	Only Fintech App users. They show that spending increased discontinuously upon receipt of the EIP. Low-income areas increased spending the most.
Coibion, Gorodnichenko, and Weber (2020)	Nielsen Homescan survey	1	0.4	Not specified	The MPC was derived from those who say mostly increase spending, mostly increase saving, mostly pay off debt.
Cox et al. (2020)	Chase bank account	1	NA	NA	Excludes the unbanked. They show spending rebounded in mid-April after the first EIP was disbursed.
Karger and Rajan (2021)	Fintech bank account (Facteus)	1 and 2	0.46	Two weeks	Lower income sample.
Misra, Singh, and Zhang (2020)	Fintech bank account (Facteus)	1	0.29–0.51	Four days	Lower income sample. MPCs higher in areas that were dense, high cost-of-living, and more movement restrictions.
Sahm, Shapiro, and Slemrod (2020)	Michigan Survey of Consumers	1	0.40–0.60	Yearly	MPC is backed out from questions about mostly increase spending, mostly increase saving, mostly pay off debt.
Cooper and Olivei (2021)	Fintech bank account (Facteus)	1	0.66	Sixteen weeks	Lower income sample. They control for other income receipts such as tax refunds.
Parker et al. (2022)	Consumer Expenditure Survey	1	0.11	Quarterly	The MPC is 0.73 for those who received payment via debit card.

Comparing Transaction and Survey Data

The proliferation of new data sources is a welcome development in our efforts to better understand the consumption response to rebate checks. However, a variety of challenges arise in comparing results across the myriad of different sources. Each data source represents a unique slice of consumption behavior, and it is important to understand the advantages and limitations of each.²⁴

The advantages of transaction data relative to survey data typically include its high frequency, low measurement error conditional on observation, large sample size, panel length, and granularity.²⁵ The limitations include measurement error in observing consumption categories; lack of account completeness; difficulty in observing large, durable purchases; and lack of representativeness of users.

The types of spending covered by transaction data and survey data also vary. Transaction data typically track debit and credit cards and will miss larger durables that tend not to be purchased with cards, such as automobiles. Transaction data may also misidentify transfers and debt repayments as spending. Lastly, transaction data will categorize spending based on the point of sale rather than the type of item purchased.²⁶ Survey data cover a wider range of consumption goods but are subject to recall error if individuals misremember exactly what they bought over the reference period, which may vary from days to months.

Another difference between transaction and survey data is the unit of observation. Transaction data capture bank and credit card accounts, and it is not always clear if these accounts represent spending for an individual or a household. On the other hand, survey data typically use households as the unit of observation.

We view transaction and survey data as complementary sources used to uncover various aspects of the consumption response to rebate checks. The high-frequency nature of transaction data allows us to better understand the speed of the consumption response. Furthermore, the larger sample sizes found in the typical transactions dataset—relative to survey datasets—allow us to better investigate heterogeneity in the response across demographic characteristics. On the other hand, the more comprehensive nature of survey data allows us to obtain a more complete picture of spending. Lastly, the carefully crafted

24. See Baker and Kueng (2021) for a detailed discussion of the advantages and limitations of household financial transaction data relative to other sources.

25. There are many different types of transaction data sources. There is generally a tradeoff between depth and breadth. For example, aggregators like Mint.com may include various accounts from different providers but will not include users who do not use the platform. The other extreme is data from credit card providers (e.g., Visa) that include the whole universe of Visa-card users but do not include other accounts that those individuals may also use.

26. For example, a purchase at Walmart can include a wide variety of goods, such as food, electronics, appliances, and clothing.

national representativeness of survey data allows us to better understand the aggregate response of consumption.

While it is hard to know exactly how estimates derived from survey and transaction data differ, there is some evidence that they provide similar estimates within the same dataset. Parker and Souleles (2019) combined transaction data (barcode level scans of items purchased) and survey data (questions about how respondents spent their rebate) for the same respondents to estimate the effects of the ESA 2008. The authors found that individuals reporting that they would mostly spend their rebate exhibit spending that is twice the amount of those reporting that they would use the rebate to either mostly save or mostly pay down debt. Furthermore, they found that estimates of the average propensity to consume are similar using both methods. Because the study used different elicitation methods within the same sample, it cannot address the concerns regarding differences in the representativeness between typical transaction and survey datasets.

Studies Using Transaction Data

While not specifically focused on the spending response to the EIPs, the first studies using transaction data helped us understand income and spending dynamics during the early stage of the pandemic. Cox et al. (2020), using account-level data from JP Morgan Chase Institute (JPMCI), found that the weekly spending of the average JPMCI account holder fell roughly 35 percent from the second through fourth week of March 2020 relative to the same period in 2019. While the initial spending declines are roughly comparable across income quartiles, they find that, in the weeks immediately following the April 15 disbursement of the majority of EIP payments, spending mostly rebounded to pre-pandemic levels for the lowest income group while it remained 20 percent below pre-pandemic levels for the highest income group. While the study did not specifically isolate the impact of rebate checks, it was one of the first studies to imply that rebate checks played an important role in stabilizing spending.

Chetty et al. (2020) compared consumption during the pandemic to consumption in January 2020 using data on credit and debit cards collected from Affinity Solutions Inc. and cash transaction data collected from CoinOut. They found similar initial reductions in spending as the pandemic began and similarly large increases in consumption after April 15: for households in the lowest income quartile zip codes, the consumption increase was equal to 25 percent of pre-pandemic consumption and for households in the highest income quartile zip codes, the increase was 8 percent of pre-pandemic consumption.²⁷

27. Chetty et al. (2020) used data that was aggregated to the zip-code level for confidentiality purposes and was smoothed to a seven-day moving average to smooth out weekly fluctuations in spending. They were unable to examine heterogeneous responses at the account

Chetty et al. (2020) also found that spending on durables rose much more than spending on in-person services.

The next set of studies focus specifically on measuring the MPC out of the EIP payments. One major caveat is that the samples consist of younger and lower income individuals who may have higher MPCs because they have less capacity to borrow.

Baker et al. (2020) estimated MPCs using bank account data from the Fintech app SaverLife. The median post-tax income of \$25,824 and median balance of \$98 reflect a user base that is low income and struggling to save money. Examining daily expenditure data, they found an MPC of 0.37, with the spending response occurring entirely during the first two weeks after EIP receipt but concentrated during the first week. When weighted by demographic characteristics to account for the younger and lower income population, the implied MPC for the U.S. population falls to 0.27. Compared to previous stimulus payment episodes, the authors found less spending on durables and more spending on food and bill payments, such as rent and mortgages. When investigating heterogeneity, they find that individuals with lower incomes, greater income drops, and less liquidity show the largest responses.

A set of papers estimate the MPC out of the first round of EIP payments using transaction-level data from Factiveus. The majority of the Factiveus accounts are linked to prepaid cards and tend to be held by much lower income, unbanked, and younger individuals (Cooper and Olivei 2021). While these papers all use the same dataset, the actual analysis sample varies depending on the filtering criteria used. For example, median annual *post-tax* income is \$17,976 in Karger and Rajan (2021) and \$24,337 in Cooper and Olivei (2021). Karger and Rajan (2021) found an average MPC of 0.46, again concentrated in the first two weeks. Investigating those with lower and higher savings rates from January to March 2020, they found that those who only saved a little pre-pandemic had an MPC of 0.6, compared to an MPC of 0.24 for those who had saved more. Cooper and Olivei (2021) followed cardholders for a longer period. In contrast to other studies, they controlled for the receipt of tax refunds and other non-stimulus income.²⁸ They found a cumulative MPC similar to Karger and Rajan (2021) within the first two weeks, which grew to 0.66 over 16 weeks. Misra, Singh, and Zhang (2020) leveraged a publicly available version of the Factiveus data that contains daily spending that is aggregated to the zip code level and found an MPC of 0.51 within a few days of receipt. All of these papers focus on the first round of EIP receipt. As of the writing of this chapter, there has been very limited work examining the spending response to subsequent rounds of EIP

level but instead used geographic variation, such as zip code-level average income, to explore differences in the spending response across groups.

28. They find that while the initial spending reaction to the EIP payments is smaller than the reaction to tax refunds and other non-stimulus income, the cumulative spending reaction after 16 weeks is larger.

receipt. Using the same data as Chetty et al. (2020), Chetty, Friedman, and Stepner (2021) found that the response to the second EIP was lower than to the first EIP, with larger differences in the highest income quartile zip codes. Similarly, Karger and Rajan (2021) found an MPC of 0.39 from the second EIP, compared to 0.46 following the first EIP. While the MPCs are not dramatically smaller, these studies suggest that subsequent rounds of stimulus provided less of a boost than earlier rounds. While there is no clear evidence on why the response to the second EIP was smaller, one possible explanation is that households had relatively higher levels of liquidity at the time of the second EIP due to unspent portions of the first EIP, access to income from other benefits enacted during the pandemic, as well as an improvement in the labor market.²⁹

In summary, studies using transaction data show a robust and rapid spending response to the EIPs for samples they studied. The MPCs range from 0.25–0.51 when measured over the first few weeks and 0.66 over a period of 16 weeks. Furthermore, the granularity of the data and larger samples allow the authors to investigate whether the MPCs are heterogeneous. In general, these studies confirm that individuals with less liquidity tend to have higher MPCs. This is a useful finding that can provide insight into the possible targeting of future rebate checks. The main weakness of transaction data used in many of these studies is the overrepresentation of younger and lower-income individuals.³⁰ While it is useful to understand the behavior of low-income individuals that likely benefit the most from the EIPs, we should not interpret the findings as representative of the U.S. population.

Studies Using Survey Data

Studies using survey data are easier to compare across time relative to transaction data because they use a more consistent sampling frame and methodology. Two types of survey dataset questions are used to examine consumption responses. The first type of question asks respondents to record and/or recall recent purchases, usually prompting them to focus on (detailed) expenditure categories. MPCs are computed by comparing spending between individuals using differences in the timing of when the rebate is received, amounts that are received, and rebate eligibility status. The second type of question, pioneered by Shapiro and Slemrod (2003b), asks survey participants whether they used rebate checks to “mostly increase spending,” “mostly increase saving,” or “mostly to pay off debt.”

Coibion, Gorodnichenko, and Weber (2020) and Sahm, Shapiro, and Slemrod (2020) both surveyed participants using the Shapiro and Slemrod

29. We discuss the evidence regarding the impact of the EIPs on household liquidity in the Longer-Term Impact on Spending section below.

30. The median post-tax income of the samples used in these studies is much lower than for the United States as a whole.

methodology. The former used the Nielsen Homescan panel in July 2020, which uses sampling weights to provide a nationally representative estimate. They found that 15 percent reported that, as of July, they had mostly spent the EIP while one-third reported that they mostly saved their EIP. When they asked households to assign dollar amounts to different categories of EIP use, they found on average 40 percent was spent, 30 percent was saved and 30 percent was used to pay down debt. The MPC is higher for those who are liquidity constrained, out of the labor force, residing in larger households, less educated, and receiving smaller amounts.

Sahm, Shapiro, and Slemrod (2020), interviewing individuals in May and June 2020 as part of the Survey of Consumers, found a nearly identical distribution of responses across spending, saving and debt repayment as Coibion, Gorodnichenko, and Weber (2020). Boutros (2020) and Parker et al. (2022) used a question that is worded slightly differently: mostly to pay for expenses, mostly to pay for debt, or mostly to add to savings. Using the Household Pulse Survey, Boutros (2020) found that roughly 75 percent of households receiving an EIP reported using it to mostly pay for expenses while only 11 percent reported using it to mostly add to savings, and 14 percent reported using it to mostly pay for debt. Parker et al. (2022) used questions from the June and July 2020 Consumer Expenditure Survey (CE) and found figures of 56 percent, 26 percent, and 18 percent for individuals reporting they used the EIP to mostly spend on expenses, savings, and paying off debts, respectively. The difference in wording makes it difficult to compare the responses in the HPS and CE with related questions in other studies.

Parker et al. (2022) used the CE Interview Survey, which contained questions about the amount of, timing of, and method of payment for the first round EIP. Examining quarterly spending changes within households, which exploit variation in the amount and timing of EIP receipt, they reported a three-month MPC of 0.10 for both nondurable and total spending. They did not find evidence of increased spending after the initial three months except for strictly nondurable goods. Although that small MPC is quite difficult to reconcile with the survey response that 56 percent reported mostly spending the EIP, the research did find an MPC that is at least double the magnitude among those that reported mostly spending their EIPs relative to those who reported mostly paying off debt and saving, respectively. The authors list a few concerns regarding the MPC estimates relative to Johnson, Parker, and Souleles (2006) and Parker et al. (2013), which studied the 2001 and 2008 rebates, respectively. Prior studies used the randomized and varied timing of rebate disbursement to estimate the MPC. However, for the EIP, timing was neither random nor very spread out.³¹ When using the estimation method from their previous papers, they reported statistically weak and inconsistent results across specifications.

31. Their study showed that 45.2 percent of recipients received the EIP on April 10 and 63.8 percent received the EIP in April.

Instead, to compute the MPCs for the 2020 EIP, they used a different procedure meant to better exploit the differences in spending across recipients and nonrecipients. Similar to other studies, they found that households with lower liquidity (either lower liquid wealth or due to receiving EIPs on debit cards) had higher MPCs relative to those with higher levels of liquidity.³²

In summary, survey studies that directly asked recipients how they spent the payments found strong responses. Coibion, Gorodnichenko, and Weber (2020) found an MPC of 0.40 when asking individuals to assign dollar values to their rebate spending. Parker et al. (2022) estimated MPCs from the CE, which surveyed individuals about their spending. They found much smaller MPCs of 0.10 for nondurable and total spending. They provided three possible reasons for their small estimates. The first is that the pandemic limited spending opportunities; the second is that other studies overestimate the MPC due to their focus on lower-income individuals, which leads to a less representative sample; and the third is statistical issues that arise from statistical uncertainty and differences in speed of disbursement and broad eligibility of the rebate checks when compared to previous episodes.³³

Longer-Term Impact on Spending

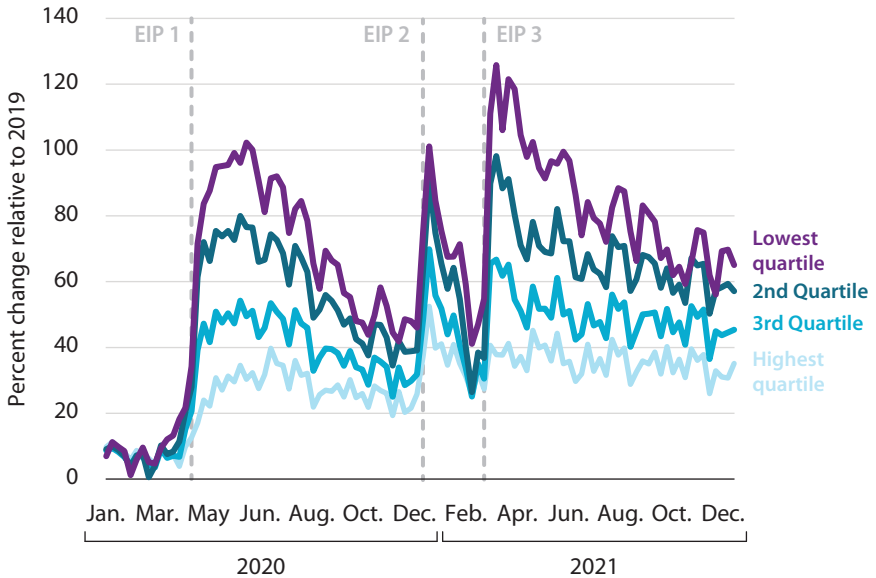
While much of the research discussed above has naturally focused on the spending associated with EIP benefits, there is also interesting evidence on how EIPs impacted savings during the recession. Figure 3.1, which is taken from Greig, Deadman, and Sonthalia (2022), shows the impact of the EIP on checking account balances of JPMC customers over a sustained period of time, relative to the January 2019 balances, by pre-pandemic income quartile (2019 income). They found that the biggest initial percentage increase in checking account balances was in the lowest income quartile. For all income quartiles, checking balances remained elevated months after each EIP was disbursed. However, Greig, Deadman, and Sonthalia found that these balances were decreasing relatively rapidly in the weeks following the disbursement of EIP benefits. This finding is consistent with households using their EIPs over a longer period of time, although it is unclear how these funds are distributed over new purchases, covering fixed expenses (e.g., mortgages, rent, utility bills, etc.), or paying off past debts.

32. As noted above, receiving a debit card is an indicator for lower-income individuals who either did not file for taxes, filed for taxes but did not receive a refund, or had an invalid banking account on file with the IRS.

33. The 2001 and 2008 rebate had much more variation in the timing of when the rebate checks were received. This helped to identify the MPC by comparing the spending of those that received the checks in certain months to those that had not yet received it but would at a future date. Because the EIPs were sent out so quickly in 2020, there is much less of this variation with which to estimate the MPC.

FIGURE 3.1

Percentage Change (Relative to 2019) in Median Checking Account Balances by Income Quartile, JP Morgan Chase Customers



Source: Greig, Deadman, and Sonthalia 2022.

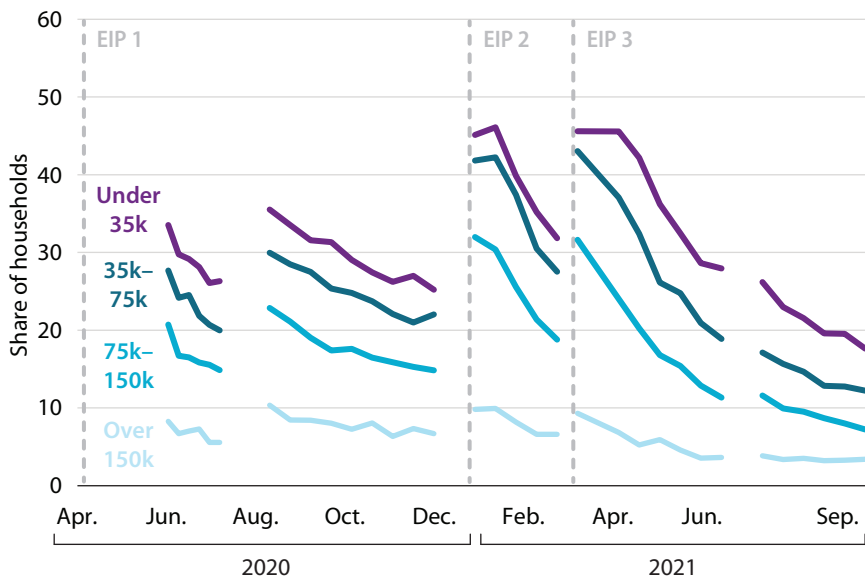
Note: Income quartiles are based on household total income in 2019, households in the lowest income quartile earned between \$12,000 and \$26,171, quartile 2 earned less than \$40,826, quartile 3 earned less than \$64,974, and highest quartile earned more than \$64,974.



The findings in Figure 3.2 are complementary to the findings in Figure 3.1 in regard to EIP spending. Beginning in week 7, households in the HPS were asked, “Thinking about your experience in the last 7 days, which of the following did you use to meet your spending needs? Select all that apply.” EIPs are one of the sources about which households are prompted to respond regarding recent spending. What is striking is that, although such funds are clearly fungible, households reported spending out of the EIPs many months after they were received. Moreover, the reported spending rates differ across income quartiles in a manner analogous to the findings for savings account balances, with the lowest income quartiles reporting the highest use of these EIPs to cover their

FIGURE 3.2

Share of Households Reporting Spending from Economic Impact Payment in the Last Seven Days, by Income Quartile



Source: U.S. Census Bureau Household Pulse Survey n.d., authors' calculations.

Note: The HPS asks respondents the sources spending used to meet need over the previous seven days. This shows the share of households who reported using their EIP. HPS phases are denoted by line breaks.



spending needs. These results suggest that the EIPs may have helped households prop up their spending many months after the benefits were received.³⁴

Understanding the longer-term impact of EIP payments on spending is quite helpful, especially given the insurance motivation noted above for widely distributing these benefits. One issue limiting these investigations from a research perspective is the timing of the EIP distribution. While policymakers rightfully wanted to distribute benefits as rapidly as possible, the lack of

34. The across-the-board reported rise in EIP use between July 2020 and August 2020 corresponds to the switch between Phase 1 and Phase 2 of the HPS. In addition, the survey response rates increased when moving between these two phases. However, the precise reason for the observed increase in reported EIP use is unknown.

variation in the timing of benefit receipt makes it challenging to disentangle the timing of benefit receipt from other macroeconomic events. In other words, if everyone receives benefits on the same day, it is hard to separate spending even one week after the benefits were distributed to the receipt of the EIP as opposed to other changes in the economic environment (e.g., a sharp decline in stock prices).

Comparisons to the Prior Literature

While access to and use of transaction data for research purposes has dramatically expanded in recent years, there is scant research using such data to examine prior rebate and stimulus payment responses. Agarwal, Liu, and Souleles (2007) examined the payment, spending, and debt response to the EGTRRA 2001 rebate using monthly credit card account data from a national financial institution. They found an immediate increase in payments to the credit card that was followed a few months later by an increase in card spending. While they found insignificant cumulative impacts on average nine months after rebate receipt, they found a cumulative MPC of 0.40 among those for whom the account in the sample was their most intensively used one.³⁵

Notable examinations of prior stimulus payments made use of the CE data. These studies typically reported the MPC of nondurable and total consumption. This is useful for both testing economic theories as well as understanding which types of spending respond the most to rebate checks.³⁶ Johnson, Parker, and Souleles (2006), using CE data with added questions about the EGTRRA 2001 rebate timing and amounts, found an MPC for nondurable consumption between 0.2 and 0.4 within three months and 0.66 within (roughly) six months of rebate receipt. Using a similar approach to analyze the ESA 2008 payments using CE data, Parker et al. (2013) found a nondurable MPC between 0.12 and 0.3 and a total consumption MPC between 0.5 and 0.9 within three months. They failed to find a significant effect for the second three-month period, but with this caveat in mind, the six-month estimated MPCs are 0.4 and 1.2 for nondurable and total consumption, respectively.

Misra and Surico (2014) reanalyzed the CE data for these two stimulus episodes, allowing for heterogeneous responses using quantile regressions. They found that roughly half of households did not change their consumption when receiving the stimulus while 20 percent of households spent over half of

35. This result also highlights one of the limitations of account data that we discussed above: having access to only a portion of a household's financial situation provides an incomplete picture of their spending decisions.

36. Economic models are based on maximizing the utility that individuals receive from consumption. While it is safe to assume that individuals receive immediate utility from consuming goods such as food or entertainment, it is not so clear how to allocate the utility received from durable purchases, such as cars or housing.

their rebate within three months. They also found smaller longer-run MPC estimates than in the earlier papers, although their findings fall within the confidence intervals of the prior point estimates.

Broda and Parker (2014) used weekly spending data from the Nielsen Consumer Panel (NCP) along with additional survey questions to measure the impact of the ESA 2008 payments. They found a spike in spending the week that the ESA payment was received, and the spending remained elevated, although by a declining amount, throughout the first quarter after the payments were received. While they cannot directly compute an MPC since the NCP only collects data on a subset of items, their rescaling of the NCP spending estimates yielded a total MPC between 0.5 and 0.75 for one quarter after disbursement.

Another set of papers in this literature leveraged the question about how the household would mostly use the payment. Shapiro and Slemrod (2003b) found that 22 percent of households would mostly spend the EGTRRA 2001 rebate while 32 percent would mostly save the rebate. When using the same approach to examine the ESA 2008 payments, Shapiro and Slemrod (2009) found very similar results of 20 and 32 percent, respectively. Shapiro and Slemrod (2003a) provided a framework to convert these responses into an aggregate MPC, which they find to be, after making some additional assumptions, around 0.35 for the EGTRRA 2001 rebate. Shapiro and Slemrod (2009) used this same methodology to estimate the aggregate MPC for the ESA 2008 payment to be under one-third.

In summary, the estimated MPCs in response to these earlier stimulus payments cover a wide range depending upon the time frame and consumption measure examined. Kaplan and Violante (2014) surveyed the prior literature and concluded that a reasonable estimate of the MPC for nondurables after one quarter is 0.25. Extending the time frame to two quarters yielded an estimate that ranges between 0.3 to 0.66 while examining total consumption for two quarters yielded estimates between 0.5 and 0.9.

Summarizing the Evidence

Comparing the EIP MPCs to previous studies is challenging for studies using transaction data. There is no direct analogue between the nondurable and durable concepts used in the CE and the spending categories used in the transaction data. Furthermore, the sample used in transaction data studies tend to be younger, lower-income individuals. Baker et al. (2020) attempted to correct for the demographic differences and found an MPC 0.27. Interpreting this as a mix of nondurable goods and expenses, the MPC does appear to be smaller than previous rebate episodes.

The most consistent results across rebate check episodes come from the Shapiro and Slemrod (2003b) “mostly spend” type questions. These studies show slightly smaller responses to the EIP compared to previous rebate checks. While

Parker et al. (2022) attempted to keep the sample and econometric specification consistent with previous studies of the 2001 and 2008 episodes, the difference in how the rebate checks were paid out led them to deviate from earlier studies. These changes prevent us from fully knowing whether their smaller estimates are due to the pandemic or to differences in analysis methods.

In summary, the various studies analyzing the spending response to the EIPs show similar or smaller responses compared to previous rebate checks. This may be the result of fewer spending opportunities as consumers stayed home due to COVID-19 restrictions, higher liquidity from other government benefits, and increased saving due to uncertainty. Studies that use nationally representative samples, such as the CE, likely deliver the best estimates of the average nationwide increase in spending stemming from the EIP payments. They also have the advantage that they are more easily comparable to past studies that use the same survey. Because these survey data are only available with a lag, high-frequency transaction data provide a useful snapshot of the early response to rebate checks. Furthermore, the granularity and panel nature of transaction data lead to more precise estimates of the sample they cover. Unfortunately, transaction data are not designed to be representative; e.g., the transaction data used in the EIP analyses include disproportionate shares of younger and lower-income individuals. Because the rebate checks often target low-income individuals, these studies can still provide useful information to policymakers. It is important to keep in mind, however, that the results are not generally representative of the U.S. population. Lastly, because there is currently no standardization in the analysis sample, estimation procedure, or spending categories for transaction data, comparing results across these studies remains a challenge.

Lessons Learned

What lessons can we learn from the COVID-19 stimulus payment response that we can apply to the next recession?

Stimulus Payments Can Now Reach Most People Very Quickly

As noted in the U.S. Federal Rebate and Stimulus Payments section, earlier rebate and stimulus payments were delivered via paper checks that arrived in the mail. It was only beginning with the stimulus payments legislated by ESA 2008 that the federal government began disbursing these payments electronically. As such, these earlier payments did not arrive until several weeks after the legislation was signed.

The use of electronic disbursement dramatically shortened the period between the signing of the legislation and the initial arrival of payments. For

the first EIP, it took about two weeks for the Treasury to send the first direct deposits out. Over the subsequent EIP rounds, the gap between signing the bills enacting the EIPs and the disbursement of funds narrowed even further. The second EIP narrowed that gap to about one week while the third EIP's first batch of payments were made the day after the legislation was signed. The government's ability to inject cash into the economy quickly—whether it be intended as a stimulus or insurance, especially when compared to past reliance on mailing paper checks—shows that fiscal policy can be implemented rapidly with minimal transaction costs.

However, as noted earlier, while many households received their first EIP rapidly, there were some who had to wait a long time. In particular, the most vulnerable populations are those who are least likely to have valid account information on file with the IRS. Marr et al. (2020) noted that of their estimate of 12 million people who did not automatically receive an EIP payment, 75 percent were concurrently enrolled in either Medicaid or SNAP. They suggested that partnering with state and local governments to encourage these households to apply for these benefits—both through direct outreach as well as in the context of routine interactions with clients online, on the phone, or in person—could help increase uptake. A high priority should be to leverage the experiences from ultimately providing EIP payments to this population in order to build an understanding of how to shorten the time lag for disbursing funds to this group during the next recession.

Stimulus Payments Can Inject Cash Into the Economy Quickly

The proliferation of studies using high-frequency administrative account data has made clear that individuals spend the rebate checks almost immediately after receiving them. Baker et al. (2020) and Karger and Rajan (2021) found an immediate spike in daily spending upon receipt of the EIPs. Cooper and Olivei (2021), who examined the longest period following EIP receipt among the studies using transactions data, found that two-thirds of the MPC response occurred within the first two weeks. Earlier research, which had been limited to examining responses at quarterly intervals—except for Agarwal, Liu, and Souleles (2007), who used monthly data—could not uncover the speed with which households responded to the rebate checks.

Prior research had suggested that households respond quickly to income receipt. Daily-level data has been used to show that individuals respond very quickly to the receipt of government benefits and paychecks (Stephens 2003; Gelman et al. 2014; Olafsson and Pagel 2018). Furthermore, daily and monthly data has been used to show that much of the consumption response to tax refunds occurs within the first month (Baugh et al. 2021; Gelman 2021).

However, until now, the necessary data had not been available to link the speed of these responses to stimulus payments.

The speed of the spending response further underlines the importance of getting checks to households that do not receive them automatically. It has been well established that low-income households have larger MPCs across a variety of domains, including prior rebate checks. When combined with the fact that the bulk of the spending occurs quite rapidly, it suggests that resolving the hurdles to getting EIPs in the hands of the households who do not receive them automatically will provide another means for quickly getting cash into the economy.

Determining Whether Stimulus Payments Are Well-Targeted Depends on Policymakers' Objectives

The question of whether stimulus payments are well-targeted hinges crucially on how they are intended to function in the economy. If the goal of providing cash transfers is to relieve economic hardship, other programs, such as UI benefits, may be better positioned to do so. As shown in Table 3.2, households with higher pre-pandemic income were less likely to face lost employment income due to the COVID-19 recession. Yet a sizable number of households that did not experience any adverse income or employment shocks still received the EIP. However, UI benefits carry an administrative burden in being distributed while stimulus payments can provide quick relief to households although they are not well-targeted for this purpose.

If the goal of sending stimulus payments is to bolster aggregate demand, then distributing these to households with the highest MPCs should be the priority. As discussed above, many of the studies discussed in this chapter have shown that those with lower income and liquidity and who faced income shocks have higher MPCs. Under this criterion, the income phaseout rules do lead to better targeting. While stimulating the economy was not likely the main goal of the EIP payments during the pandemic, this is often the stated role of stimulus payments in a typical recession.

However, if the goal is to provide relief to the households particularly harmed by the recession, that might involve distributing EIPs to those with lower MPCs. In that sense, the policy should target those who have lost income or are in danger of losing income. Initially in a downturn, reaching everyone in danger of losing income likely entails broad distribution. Over time, that group should become easier to identify, allowing more targeted distribution. For example, in a pandemic such payments might be focused on workers in sectors, such as in-person services, that are most vulnerable to demand fluctuations. Another reason to rely on EIPs is that, because cash is fungible, EIPs can be more efficient than using different programs to target specific needs.

Payments Such as EIPs Can Fill Holes Left by Other Programs

The social safety net was substantially bolstered during the pandemic. For example, workers who were typically ineligible for UI benefits, such as gig workers and the self-employed, became eligible. This may not occur in future recessions. Under those scenarios, EIP-like payments are likely to provide an important role in filling these holes.

Moreover, many eligible individuals do not apply for benefits. Prior research (Gould-Werth and Shaefer 2012) has shown that less educated people and racial and ethnic minorities typically have lower UI take-up rates. Some of the reasons for the low take-up include the complexity of the application process and people not realizing they are eligible for benefits. Because the EIPs have a very low administrative burden, it is likely that they reached people in a timely manner who were left out by other policies for a myriad of reasons.

There were also unanticipated ways in which the EIP payments filled gaps created by other policies. Because of the historic rise in UI claims in March 2020, many state employment systems were overwhelmed and were not able to process all claims on time. While all individuals who were eligible for UI eventually received their benefits, some had to wait months after applying as states worked through their backlogs. In contrast, the EIP checks did not encounter any system-wide delays in disbursement. Given the reliability and speed of EIP disbursement, it is likely that they will continue to fill in the gaps during future recessions as well.

Finally, some people lose income who are not eligible for Unemployment Insurance. These include business owners who remain open but are less profitable. In this recession, the government provided forgivable loans to many businesses, which likely helped provide relief, but that also may not occur in future recessions.

Better Data Are Needed to Identify Holes in the Social Safety Net

The EIP payments were an important way Congress protected households during the pandemic. Unlike the UI benefit extensions that were designed to offset employment losses and the SNAP program extensions, which target low-income households, the EIP benefits were distributed to a broader range of households. In addition, traditional “automatic stabilizers,” such as Medicaid, offered additional sources for supporting those households that were impacted.

Piecing together a complete picture of all the benefits that a household receives remains a challenging task. While some surveys elicit program benefit information from households, researchers have noted that many widely used, publicly available datasets severely underreport the extent of government

benefit receipt (e.g., Meyer, Mok, and Sullivan 2015). Larrimore, Mortenson, and Splinter (2021) were able to use IRS data that linked information on earnings, UI benefits, and EIP receipt to provide some insight into how these payments were able to mitigate the extent of the earnings losses that were suffered by households. They noted that with their administrative data that they were able to almost exactly match published aggregate totals while estimates of total UI benefits paid based on the Current Population Survey understated aggregate totals by roughly 60 percent.

Yet the picture remains incomplete. Our understanding of who received EIPs along with other benefits is poor because of a lack of public data. One useful change would be if more federal and state government agencies made available data on program participation, administrative earnings records, and tax returns—all with appropriate privacy protections and levels of aggregation. That would provide more clarity on how well EIPs worked as relief during the pandemic, what holes in the safety net still remained, and how EIPs could be better structured in the future to support households in need.

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Lessons Learned from Support to Business during COVID-19

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Introduction

The United States responded to the recession caused by the COVID-19 pandemic with massive and unprecedented support for businesses. New federal business subsidies during the first year of the pandemic, 2020Q2–2021Q1, including the Paycheck Protection Program (PPP), Economic Injury Disaster Loan (EIDL) Advances, and targeted aid for sectors such as airlines and restaurants, totaled \$600 billion, or about 2.7 percent of potential GDP, while expanded EIDL Loans added an additional \$200 billion of support. The Federal Reserve authorized purchases of up to \$750 billion in corporate bonds through the newly created Corporate Credit Facilities (CCFs) and up to \$600 billion in long-term, low interest rate loans to midsize corporations through the new Main Street Lending Program (MSLP).

At the same time, the business sector overall fared much better during the COVID-19 recession and recovery than had been expected at the outset. Indeed, this resilience was different from previous downturns. Business bankruptcy filings declined during a recession year for the first time since 1980 and remained below their pre-pandemic level into 2021. After peaking in April 2020, the unemployment rate fell faster than in any other post–World War II recovery period, and job vacancies in 2021 reached their highest level on record.

We critically evaluate the business aid programs and their role in cushioning the downturn and spurring the economic recovery. We do so especially with an eye toward future non-pandemic-related downturns, during which

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policymakers may be tempted to return to these programs in the hope of achieving a similarly rapid recovery. However, the variety of other policy support enacted during the COVID-19 recession and reviewed elsewhere in this book—as well as the unusual course of a lockdown-driven recession—pose serious confounders to immediately concluding a causal link between the business aid programs and the economic trajectory. Our task will be to evaluate the role played by the business programs specifically and to highlight where uncertainties remain.

Our evaluation starts by setting out a framework for assessing business aid. If financial markets functioned frictionlessly and there were no externalities, there would be no rationale for government intervention on efficiency grounds. We identify two plausible deviations from this benchmark: (a) market failures that prevent long-run solvent firms from obtaining temporary liquidity and (b) externalities from worker layoffs or firm failure. Accordingly, business support should focus on alleviating financial frictions or avoiding labor market congestion, bankruptcy court congestion, and aggregate demand externalities that result when firms contract. We then review the impact of policies enacted during the pandemic period and reach the following conclusions.

First, policies to support small businesses likely could have achieved their objectives with much smaller budgetary cost by focusing on smaller firms and featuring a smaller subsidy component. The PPP made 5.1 million potentially forgivable loans between April and August 2020 with a total face value of \$522 billion. More than 50 percent of these loans were under \$25,000 and 80 percent were less than \$100,000, yet loans greater than \$500,000 that went to larger recipients account for half the budgetary cost. We survey the academic literature evaluating PPP and find no credible evidence that the largest PPP loans had a substantial positive employment effect in the short or medium run. The evidence for the efficacy of loans to the smallest firms is more mixed.

The closely related EIDL program, which gave nonforgivable, long-term loans to small businesses, also had extraordinarily high take-up, with 3.6 million loans totaling \$194 billion through November 2020 and an additional \$124 billion over the following year. Relative to PPP, these loans have the benefit of providing immediate liquidity but at much lower cost to taxpayers. In addition, EIDL loans were potentially better targeted, as only businesses with an expectation of long-term viability could apply. However, lending to already indebted firms may leave them overleveraged, creating debt-overhang problems that impede the recovery. Open questions for the small business support policies include their long-term impact on firm survival and employment and whether loans or grants are better tools from a cost-benefit perspective.

Second, the academic literature has largely neglected many of the other business subsidy programs. Two of the largest were the Employee Retention Credit and grants to air carriers. While both had features designed to link disbursements to payroll, the fungibility of funds raises the possibility that they may instead have benefited shareholders. Such concerns may be particularly

significant for the grants to air carriers, which mostly went to large, publicly traded firms, many of which had previously undergone successful bankruptcy restructuring, albeit not all simultaneously.

Third, Federal Reserve (Fed) interventions into the corporate bond market clearly can play a stabilizing role. Indeed, despite the fact that the CCFs used only approximately \$15 billion of their \$750 billion capacity, both informal event study analysis and more rigorous academic studies find that they significantly lowered bond yields in the spring of 2020. The key open question is whether doing so is desirable. In the COVID-19 crisis, large benefits were obtained even with low take-up, but those outcomes were in part due to the rapid macroeconomic recovery. Had the pandemic more strongly affected the economy in late 2020 and early 2021, the costs of intervention may have been significantly higher.

Fourth, the Fed's direct support for bank lending had little direct impact. A key design feature of the MSLP was that banks offloaded 95 percent of each loan to the Fed but retained a 5 percent slice, meaning that banks would only make loans that offered similar returns as the rest of their balance sheet. If banks had been balance-sheet constrained as they were during the 2007–09 recession, such a policy could have proven very useful. As it turned out, banks remained in relatively good health, and only \$18 billion of the \$600 billion facility was used.

Finally, given that our reading of the literature suggests that one should be skeptical of a crucial role for much of the business aid in supporting the recovery, we review other explanations for the performance of the business sector. Using Compustat financials data, we show that large firms initially reacted by raising substantial external financing from private markets. These firms raised debt by drawing down existing credit lines and increasing bond issuance and conserved equity largely by pausing share repurchase programs. This increase in financing allowed these firms to withstand the initial decline in net income. We then show that sales recovered much faster during the pandemic than during the 2007–09 downturn. Since our Compustat data covers only public firms, it is possible that small- and medium-sized private firms reacted quite differently to the pandemic. Further research is needed to shed light on the behavior of such firms.

We end by articulating four main lessons for the prospects of business aid programs to support employment and business survival in a non-pandemic-related recession. First, policymakers should not blindly redeploy the 2020 tool kit despite the positive trajectory of the current recovery, as other factors, including the nature of recovery from a temporary lockdown and general support for households, likely played a more important role. Second, if necessary, support for small businesses could likely achieve a similar objective with much smaller budgetary cost than PPP by focusing on smaller firms and providing a smaller subsidy component. Third, the fungibility of funds given to large firms, such as publicly traded airlines, and the history of successful bankruptcy

resolution for these firms suggest caution in the granting of such aid in the future. Finally, while the Fed clearly has the ability to intervene successfully in corporate credit markets, the question of whether it should do so involves careful consideration of the reason for a decline in bond prices. In addition, while not a significant element of the COVID-19 response, a policy such as the MSLP could prove useful in a future recession when banks are constrained.

Background on Business Performance

The economic recovery that began in the summer of 2020 was much faster than expected at the time or than historical experience would have predicted. To set the stage for our subsequent analysis, in this section we put the macroeconomic and business sector performance into context.

Macroeconomic Context

Figure 4.1 shows the paths of actual GDP (left panel) and the unemployment rate (right panel) against the May 2020 median forecast in the Survey of Professional Forecasters and the July 2020 forecast of the Congressional Budget Office. Despite making their forecasts *after* the CARES Act had passed, both sets of forecasters proved far too pessimistic about the depth of the downturn and the speed of the recovery. Mostly notably, the rebound in 2020Q3 far exceeded expectations.

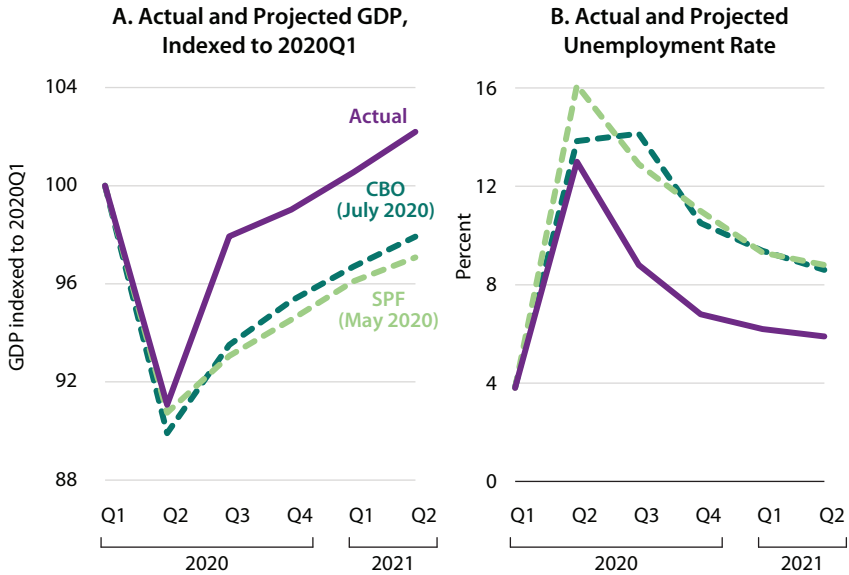
Figure 4.2 shows the historically rapid nature of the recovery, focusing on the labor market. The top panel replicates and extends the finding of Hall and Kudlyak (2021) that the unemployment rate has historically fallen by roughly 0.1 log point per year during recoveries and expansions. Against this backdrop, the more-than halving of the unemployment rate from the high of almost 15 percent in April 2020 to about 6 percent in April 2021 is unprecedented. The bottom panel plots total job vacancies, perhaps the best high-frequency measure of business demand. After falling sharply during the lockdown period, vacancies rebounded and reached a series high by early 2021 before skyrocketing during the summer and fall.

Business Bankruptcies

Along with the overall better-than-expected macroeconomic performance, business survival fared much better than feared at the recession's onset. We will focus on business bankruptcy rates as a proxy for the health of businesses generally. Historically, business bankruptcy rates have been highly correlated with economic conditions: in quarterly data from 1980–2019, a 1 percentage point rise in the U.S. unemployment rate coincides with an increase of about 600 business bankruptcies filings in the same quarter. The relationship between unemployment and bankruptcies was especially strong during the global financial crisis

FIGURE 4.1

Actual and Projected Macroeconomic Trajectories, 2020Q1–2021Q2



Source: Bureau of Economic Analysis n.d.; Bureau of Labor Statistics n.d.; Federal Reserve Bank of Philadelphia 2020; Congressional Budget Office (CBO) 2020.

Note: GDP amounts are indexed to 100 in 2020Q1, such that subsequent observations can be interpreted as percent changes from this initial level. SPF May 2020 is the release date of the second quarter Survey of Professional Forecasters (SPF) report by the Federal Reserve Bank of Philadelphia.

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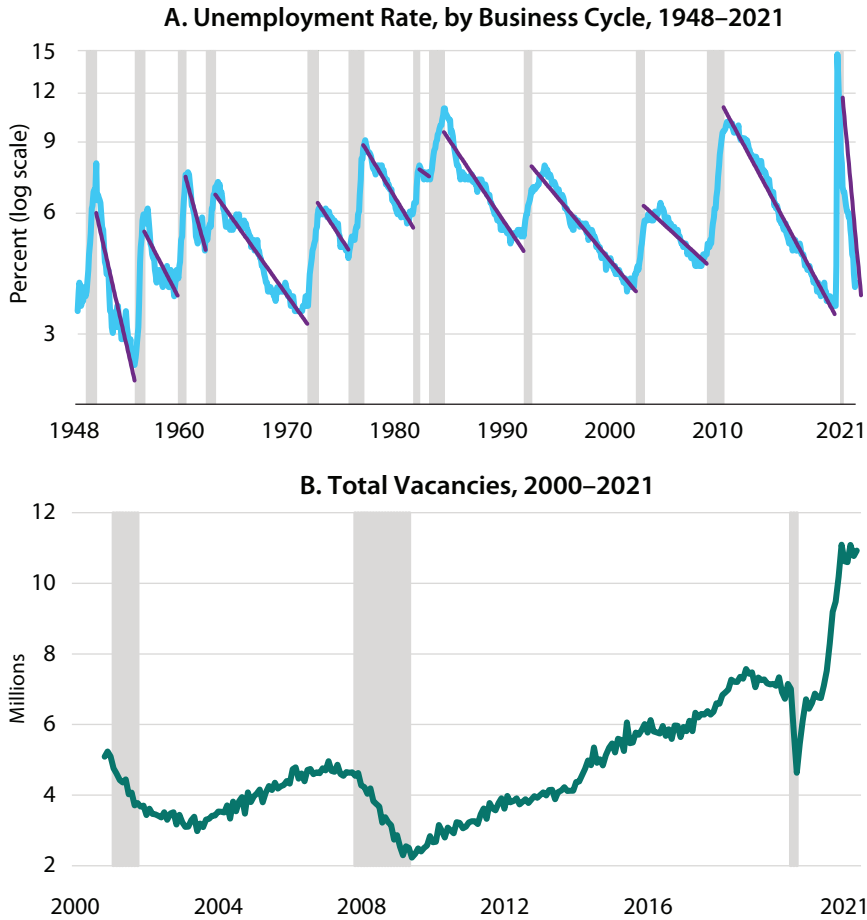
of 2008, as can be seen in Figure 4.3, which plots the unemployment rate and bankruptcy filings over time.

Given this context, the sharp increases in unemployment in March and April 2020 were cause for concern. If historical relationships had held, the 10-percentage-point increase in the unemployment rate would have led to the prediction of an additional 6,000 business bankruptcies in the second quarter of 2020 alone, doubling the 5,952 business bankruptcies in 2020Q1.

These fears did not materialize. Instead, bankruptcies *fell* with the onset of the COVID-19 pandemic. As shown in Wang et al. (2021), business bankruptcies fell 17 percent in 2020 relative to 2019, and filing rates in 2021 were similar to those in 2020. The decline in bankruptcy filings is striking given that there had not been a decline in bankruptcies during a recession since official bankruptcy statistics began being collected in 1980. Further, bankruptcy rates were already quite low in 2019, making a further decline unlikely *ex ante*.

FIGURE 4.2

Unemployment Rate and Job Vacancies



Source: Bureau of Labor Statistics n.d.; authors' calculations.

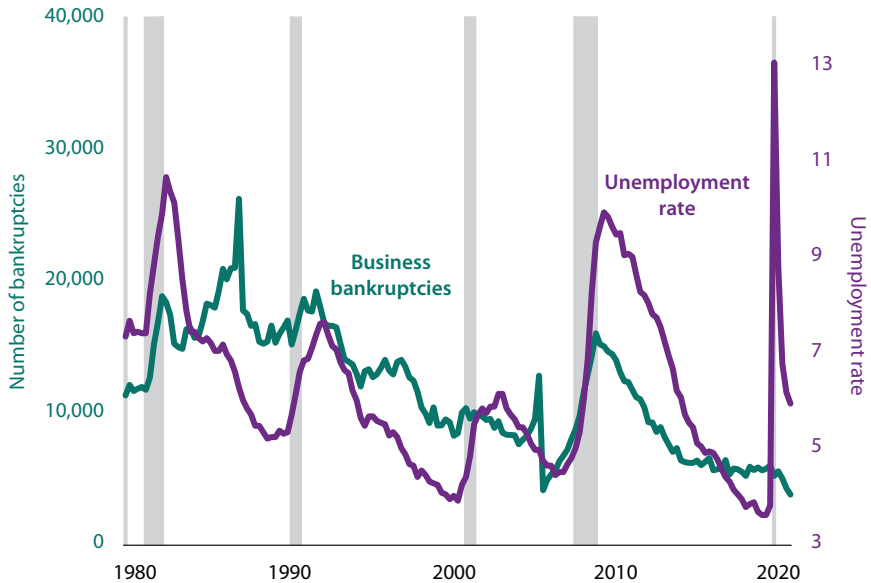
Note: In Figure 4.2a, slope lines have been added to show the average rate of decline in the unemployment rate following each recession. Steeper lines indicate more rapid recoveries. Recessions are demarcated by grey bars.



The timing and breakdown of business bankruptcies can give some indication of what precipitated the overall decline. Figure 4.4, provided by Wang et al. (2021), shows how weekly bankruptcy filing rates evolved for small and large businesses throughout 2020 relative to 2019. Small businesses, defined as those with less than \$10 million in assets, saw filing rates fall dramatically at the

FIGURE 4.3

Business Bankruptcies and Unemployment, 1980Q2–2021Q2



Source: Bureau of Labor Statistics n.d.; U.S. Courts Bankruptcy Filings Statistics n.d.

Note: Recessions are demarcated by grey bars.

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immediate onset of the pandemic, well before government support programs were put in place to support these businesses.² As the year wore on, small business filings rebounded somewhat from the initial drop but still stabilized around 20 percent lower than 2019 levels. Meanwhile, large business filings saw a short-lived decline in late March 2020 but for the most part remained close to 2019 levels throughout 2020.

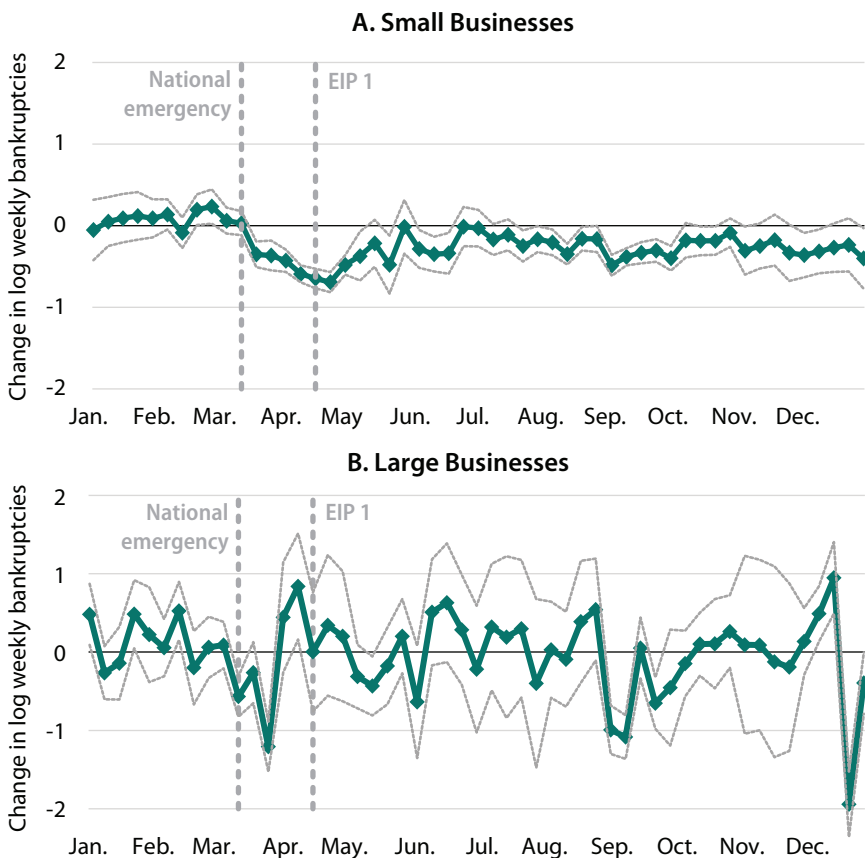
In this section, we have focused on business bankruptcy rates because official statistics on overall business failure have not yet been released.³ Given that the smallest businesses in the economy are unlikely to use bankruptcy (Greenwood, Iverson, and Thesmar 2020), it is possible that business exit rates increased even while bankruptcy rates declined. Crane et al. (2021) leverage

2. This decline was not due to physical court closures, as Wang et al. (2021) show that filings declined at the same rate in bankruptcy districts where courts were never closed.

3. The U.S. Census Bureau's (n.d.) Business Dynamics Statistics provide measures of firm startups and shutdowns, but the most recent release as of this writing is for 2019.

FIGURE 4.4

Year-Over-Year Change in Business Bankruptcy Filings, by Week, 2020



Source: U.S. Courts Bankruptcy Filings Statistics n.d.

Note: Small businesses are those with less than \$10 million in assets and large businesses are those with more than \$10 million in assets. 95% confidence intervals shown in dotted gray lines.



alternative indicators of business exit (e.g., paycheck issuance and phone-tracking data) to estimate business exit rates in the first year of the pandemic. Using these sources, they estimate that the business exit rate was about 25 percent higher than baseline in the first year of the pandemic, but they note that these alternative data sources have limitations that could lead to overstating or understating the true exit rate. A key difficulty, which was particularly exacerbated by the COVID-19 pandemic, is determining whether business closures are

temporary or permanent. Given these difficulties, it will likely be necessary to wait for administrative data to fully understand the pattern of business closures.

In summary, both the overall macroeconomy and business survival, specifically, fared much better during the pandemic than initially feared or historical experience would have predicted. Against this backdrop, we next evaluate the role of direct government aid to businesses. However, it is important to recognize that these programs came on top of several other policies and factors specific to COVID-19 that likely aided the rapid recovery and interacted in important ways with business aid. On the policy front, fiscal support to households played an important role in supporting consumer demand and thus indirectly helping businesses. This support included three separate rounds of direct payments to households in April 2020, January 2021, and March 2021, totaling over \$850 billion, and extended and enhanced Unemployment Insurance (UI). Enhanced generosity of UI in particular makes it less important to incentivize businesses to maintain employment (as the PPP and other programs did) since these workers are supported in other ways, especially during a period such as summer 2020 when public health conditions warranted having many people remain at home anyway. Bolstered by government support, total household income rose in 2020 despite the recession, and households increased their liquid assets, especially lower income households.⁴ The increase in household income and wealth created the conditions for the sharp rebound in consumer demand as the economy exited the recession, with additional fuel coming from widespread availability of COVID-19 vaccines in early 2021.

Similarly, the evolution of business practices and the course of the pandemic itself played an important part in determining business conditions. Widespread use of videoconferencing technologies allowed many to work from home. Widespread testing protocols allowed some workers to return to work. And the relatively quick development of vaccines meant that many businesses were able to partially or fully reopen sooner than might have been anticipated. All these factors together created a quick economic rebound in late 2020 and early 2021, which meant that many businesses only faced short-term cash flow shortfalls rather than fundamental insolvency. The totality of these circumstances make it important to try to isolate the role for and effectiveness of direct government support for businesses.

Framework for Evaluation

Given that the COVID-19 pandemic and associated recession were quite unusual, we cannot simply use outcomes to assess the success of business support programs and the suitability of such programs for future recessions.

4. The JPMorgan Chase Institute (2022) found that median cash balances were 65 percent higher than 2019 levels at the end of 2021 among low-income families. Cash balances for high-income families were about 35 percent higher at the end of 2021.

We instead start by highlighting conditions under which governments should provide support to businesses during a recession. We then assess business support programs in part by asking how well they address the rationales we highlight. Following Hanson et al. (2020), we suggest two main rationales, focusing on efficiency concerns: (a) market failures that prevent long-run solvent firms from obtaining temporary liquidity and (b) externalities from worker layoffs or firm failure.

If financial markets functioned frictionlessly and there were no externalities, there would be no rationale for government intervention. In this case, firms that were solvent in the long run could simply raise capital by issuing equity or borrowing against their future cash flows from banks or financial markets. The availability of private financing would allow firms to weather temporary revenue shocks, like the COVID-19 pandemic and its accompanying public health interventions. For instance, consider a restaurant that faces temporarily low cash flows due to the pandemic but will ultimately be viable (i.e., have post-pandemic profits that exceed the costs of surviving the pandemic). If financial markets functioned perfectly, the restaurant would be able to borrow enough to survive. This argument applies even in the face of the extreme macroeconomic uncertainty created by the pandemic. In uncertain environments, firms retain option value by deferring the decision to shut down until there is more clarity on the path of the economy. In frictionless markets, lenders and investors recognize that this option is valuable and are willing to contribute funding immediately in exchange for the possibility of a future payoff.

Thus, deviations from this frictionless benchmark are necessary for government interventions to be warranted on efficiency grounds. The first rationale for intervention we consider arises because credit markets may not function well enough to enable firms with viable long-run business prospects to raise enough financing to meet temporary liquidity needs. The lockdown conditions that prevailed in the spring of 2020 and caused revenue at many firms to fall precipitously provide an example par excellence of when fixed costs such as rent or debt obligations could cause firms to fail if they cannot arrange temporary financing, but such circumstances arise in all recessions. Again, in a first-best world with perfect credit markets, full enforcement of contracts, and no asymmetric information, long-run solvent firms could obtain such financing from private sources and government intervention would not be necessary.

However, these conditions may fail in a variety of ways, particularly in a crisis. For instance, lending may become constrained because banks take losses on their existing loans at the onset of a crisis, reducing their capital buffers and creating debt overhang. In early 2020, there was significant concern that bank capital buffers would be rapidly depleted during the COVID-19 pandemic (Feldman and Schmidt 2021). Alternatively, the nature of firm cash flows may change in a way that makes it difficult for banks to continue lending. For instance, it may become more difficult for lenders to discriminate between long-run solvent and insolvent borrowers, causing them to exit credit markets

completely. In this case, even solvent firms may not be able to borrow. A third potential financial friction involves changes in the nature of cash flows that make it difficult for solvent firms to fully pledge future cash flows to lenders. For instance, banks may have an advantage in holding low-risk assets i.e., in making relatively safe loans (Diamond 2020). If an economic downturn increases uncertainty about future cash flows, as the COVID-19 pandemic did, new loans will be riskier, even if they are made to firms that will be viable in the long run, on average. Banks with a preference for relatively safe lending may not be well-suited to provide such incremental financing to firms. Firms that have access to financing outside of banks could then turn to other capital providers, but finding new financing is costly for all firms and may be impossible for many small and medium firms (Fazzari, Hubbard, and Peterson 1988). Finally, credit markets may suffer from fire sales (Shleifer and Vishny 1992; Stein 2012) or market freezes (Diamond and Rajan 2011), which can impede the ability of healthy firms to raise financing. In the presence of such frictions, government interventions may be helpful. These interventions can take the form of direct assistance, supplements to bank financing, or central bank policies, such as asset purchases, that help to ensure well-functioning financial markets.

The second rationale for government intervention involves negative externalities from firm shrinkage or exit. The idea is that there are benefits to keeping firms alive that accrue to neither the firms themselves nor their lenders. In such cases, government intervention can be valuable even if financial markets function well. For instance, if too many firms simultaneously seek bankruptcy protection, the resulting congestion in bankruptcy courts can lead to inefficient liquidations (Iverson 2018; Greenwood, Iverson, and Thesmar 2020). Existing research suggests that the deadweight loss from such congestion can be large. For instance, Iverson (2018) found that a 6 percent increase in bankruptcy caseloads increases the loss given default on commercial and industrial bank loans by 3.9 percentage points (relative to a mean loss given default of 36 percent). In a typical recession, caseloads rise 25 to 50 percent, suggesting scope for significant losses from congestion.

Labor market congestion is a second type of externality that can justify government intervention. If too many laid-off workers simultaneously search for new jobs, they can impede the employer–employee matching process, resulting in fewer hires and lower quality matches (Blank and Maghazian 2021). More broadly, such separations risk destroying firm-specific human capital, slowing down the eventual recovery. The widespread use during the pandemic of temporary layoffs, in which workers expect to be recalled to their previous employer, mitigates such concerns but may not eliminate them.

A third type of externality occurs when lower consumption by laid-off workers contributes to lower aggregate demand, leading output to fall further (Chodorow-Reich and Karabarbounis 2016; Farhi and Werning 2016). Concerns about aggregate demand externalities loom particularly large when interest rates are stuck at the zero lower bound. While other policies—notably, generous

UI—can alternatively target the decline in consumption by laid-off workers, such considerations nonetheless strengthen the rationale for employment subsidy policies that also have this effect.

Social insurance (i.e., subsidies to business that rise in bad times) for business owners is a third rationale for government intervention that is sometimes proposed. There may be social benefits to encouraging entrepreneurship, and since entrepreneurs bear a large amount of uninsurable, undiversifiable risk, supporting small businesses could be valuable. This is particularly true given that small-business owners are typically not eligible for other forms of social insurance, like UI. Moreover, to the extent a pandemic-type shock was completely unforeseen, ex post transfers to business owners could correct for the absence of pandemic insurance ex ante (Romer and Romer forthcoming). On the other hand, as pointed out by Hanson, Sunderam, and Zwick (2021), business owners are on average relatively wealthy, so the social insurance benefits of supporting them are likely small.

While these rationales provide a case for supporting businesses in a generic recession, it is worth noting that they may have provided an especially strong case in the recession caused by the COVID-19 pandemic. Three features of the pandemic-related recession made it different from most others. First, during the early months of the COVID-19 pandemic, the correlation between firms' short-run cash flows and their longer-run solvency was likely much weaker than in a typical recession. The pandemic and associated public health interventions caused precipitous revenue declines for many fundamentally healthy firms. Against this backdrop, the risk that government support would prop up insolvent firms through so-called zombie lending was weaker than usual.

Second, the turmoil in bond markets in March 2020, while not completely unprecedented, was significantly more severe than market dislocations in a typical recession. In other words, financing frictions in bond markets were larger than usual, again strengthening the case for government intervention.

Third, macroeconomic uncertainty was significantly higher than normal in the COVID-19 recession (Altig et al. 2020). This both exacerbated standard financial frictions and increased the option value inherent in keeping firms alive, relative to typical recessions.

The rationales outlined above also have implications for the types of interventions that are likely to be most effective. For instance, if financial market frictions are the rationale for intervention, it may be beneficial to target the firms and sectors most affected by such frictions. Because small firms typically face greater financial constraints than larger firms (Fazzari, Hubbard, and Peterson 1988; Zwick and Mahon 2016) and have access to fewer sources of financing, the case for targeting government support toward small firms may be stronger than the case for unconditional support. Similarly, for firms that depend on particular banks for financing, these relationships make it difficult to seek funds from other sources (Rajan 1992; Darmouni 2020). Thus, steps to encourage bank lending may be particularly impactful. In contrast, large firms typically have many sources

of financing, including public debt and equity markets, and multiple banks with which they maintain relationships. These characteristics suggest that the gains from government support of large firms may be relatively smaller.

It is also worth noting that while the types of externalities discussed provide rationales for government intervention, it is not clear whether they justify direct aid to businesses specifically. For instance, aid to businesses may reduce the congestion of bankruptcy courts in an unexpected recession, but outside of crisis times simply hiring more bankruptcy judges is a more direct policy intervention. Similarly, aid to businesses may prevent them from firing workers and reduce labor market congestion. However, job retention subsidies may be a better-targeted policy response to the problem.

Finally, the stated purpose of a policy may not equate to its ultimate effect, because money is fungible. Policies requiring that aid be used to support payroll provide a leading example. If the recipient would have met the required payroll target even absent the aid, then the policy has in effect provided unrestricted support to the owners of the business. Evaluating specific programs therefore requires determining how the funds were actually used.

Summary of Major Programs

Table 4.1 lists the major business aid programs, the amount authorized, the amount utilized during the mostly pre-vaccine year stretching from 2020Q2 to 2021Q1, and the amount in 2021Q2–2021Q4. Several of these programs were administered by the Small Business Administration (SBA).⁵ The largest single program measured by dollars utilized was the PPP, whose size exceeds all the other federal subsidy programs combined. Other programs administered by the SBA include Economic Injury Disaster Loans (EIDL), EIDL advances, and SBA loan forbearance. These non-PPP SBA programs provided in aggregate \$344 billion in liquidity to small businesses. The new Federal Reserve programs had even larger authorizations but much lower utilization. Moreover, these programs involved asset purchases, making the subsidy amount far smaller than the authorized purchases. Finally, many state and local governments enacted business support policies.

We now discuss each of these programs in greater detail, with emphasis on evaluation of their effectiveness and the lessons learned for future downturns.

5. Our focus is on programs aimed at general business survival that were active during 2020. In addition to the programs listed in Table 4.1, businesses also received subsidies through the Provider Relief fund (\$64 billion allocated thus far) and tax credits to support paid sick leave (\$113 billion). In 2021, restaurants received support through the Restaurant Revitalization Fund (\$28 billion.)

TABLE 4.1

Distribution of Major Business Aid Programs, Billions of Dollars Authorized and Utilized

	Authorized	Utilized	
		2020Q2–2021Q1	2021Q2–2021Q4
Federal government subsidies		604	252
SBA programs			
Paycheck Protection Program	814	457	180
Economic Injury Disaster Loan advances	35	20	7
SBA forbearance	7	7	
Other programs			
Employee Retention Tax Credit		71	47
Grants to air carriers	58	29	12
Food Assistance Program	30	21	6
Federal government loans		941	169
Paycheck Protection Program	814	735	58
EIDL loans		206	111
Federal Reserve programs	1,350	33	
Corporate Credit Facility	750	15	
Main Street Lending Facility	600	18	
State and local programs	15		

Source: Bureau of Economic Analysis n.d.; Federal Reserve n.d.; Small Business Administration n.d.; authors' calculations.



Note: Authorized refers to cumulative authorizations across bills and is blank for mandatory spending. Dollar values in 2020Q2–2021Q1 and 2021Q2–2021Q4 refer to the amount of business subsidies,



loans, or purchases actually made. Federal government loans include loans to all recipients including those not in the business sector.

SBA Programs

Paycheck Protection Program

The PPP was the largest and most visible of the federal subsidy programs. Initially enacted at the end of March 2020 under the CARES Act with an authorization of \$350 billion, the program was extended and modified several times and eventually made nearly 12 million loans totaling \$800 billion before expiring at the end of May 2021. The first round of PPP funding lasted from April to August 2020 and offered term loans of an amount equal to 2.5 times average monthly payroll with a cap of \$10 million. Firms were eligible if they had fewer than 500 employees or operated in the Accommodation and Food

Services Sector with fewer than 500 employees per location. The Coronavirus Response and Relief Supplemental Appropriations Act of 2021, signed at the end of December 2020, replenished the funding for new PPP loans. It also allowed firms with fewer than 300 employees and at least a 25 percent reduction in gross receipts between comparable quarters in 2019 and 2020 to receive a second PPP loan, again based on 2.5 times monthly payroll but with a cap of \$2 million. The first and second loans were forgivable if the borrower maintained employee and compensation levels for a specified 8- to 24-week period following the disbursement and used at least 60 percent of the proceeds on payroll costs. As of December 2021, 80 percent of the total PPP loan amount, or \$634 billion, had been forgiven.

In terms of the rationales articulated for government intervention in the Framework for Evaluation section above, PPP can be thought of as serving two purposes. First, the loan aspect of the program may be thought of as an attempt to overcome financial frictions for small firms by directly supplying them with funds. Second, the grant aspect of the program can be thought of as an attempt to reduce labor market congestion or to generate aggregate demand externalities more broadly. We now review evidence that suggests that to the extent the program achieved these goals at all, it could have done so on a far smaller scale.

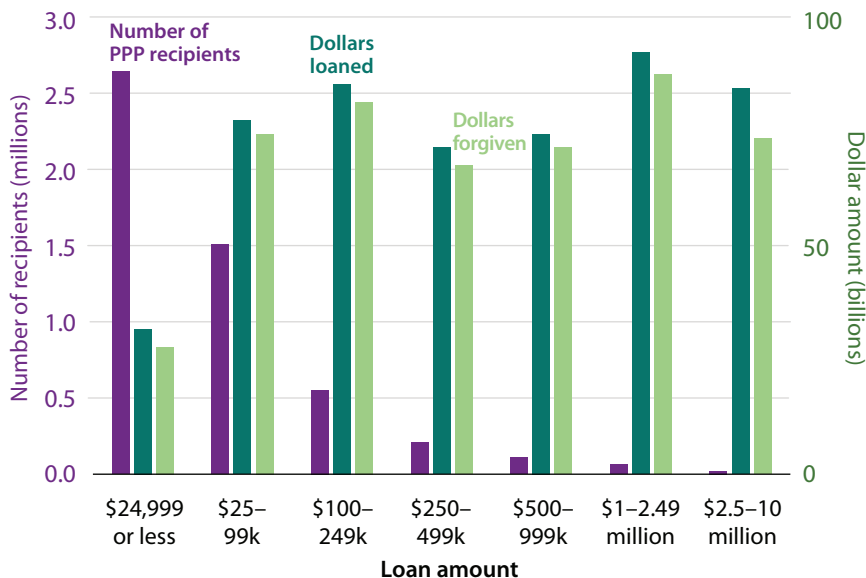
We begin our analysis of the PPP by highlighting the sharp disparities in the dollar amount allocated to smaller and larger firms. Figure 4.5 shows the number and dollar value of loans by loan size for the first PPP round (covering the period April–August 2020) using data from SBA on the universe of PPP loans.⁶ Because of the statutory link between loan amount and payroll, the distribution of loan sizes closely approximates the distribution of firm sizes of loan recipients. While half of the loans were under \$25,000, in total these loans account for only 6 percent of the dollar cost. At the other extreme, just 1.6 percent of the loans exceeded \$1 million, but these loans account for one-third of the dollar cost.

The academic literature has taken several approaches to evaluating the PPP. Perhaps the simplest is to ask how recipients adjust their balance sheets after receiving the funds. Using administrative bank supervisory data on firms with credit line commitments of at least \$1 million matched to their PPP loan, Chodorow-Reich et al. (forthcoming) found that by the end of June 2020 these firms had reduced their non-PPP borrowing from banks by \$0.95 for every \$1 of PPP funds. While not a causal estimate of the use of PPP funds, this adjustment suggests that for these larger PPP recipients (i.e., the mean PPP loan in their data is about \$1 million) the PPP loan might have partially or mostly replaced private financing.

6. Firms that received their first PPP loan in the tranche starting in January 2021 skewed much smaller than in the initial allocation, with 96 percent of the loans and 72 percent of the dollars in loans of less than \$25,000. The distribution of second PPP loans was much closer to the initial tranche.

FIGURE 4.5

Receipt of Paycheck Protection Program, by Loan Size



Source: Small Business Administration n.d.a.

Note: Left axis and purple bars represent the number of loans given, while the right axis and dark and light green bars represent the amount of dollars loaned and forgiven.



A second approach uses the 500-employee threshold as a natural experiment that separates eligible firms just below the threshold from ineligible firms just above it. Autor et al. (2020), Chetty et al. (2020), and Hubbard and Strain (2020) all pursue this methodology, with Autor et al. and Chetty et al. finding that eligible firms increased their relative employment by 2 to 3 percent in the summer of 2020 and Hubbard and Strain finding no effect in the neighborhood of the cutoff. Even the upper bound of these effects is modest relative to the size of the program, consistent with the evidence from Chodorow-Reich et al. (forthcoming) that larger recipients may have used a large portion of the funds to pay down other debt.

A third approach exploits the haphazard nature of the initial rollout period, when demand for PPP loans exceeded the CARES Act appropriation. Specifically, during the first weeks of the program, banks prioritized existing customers in processing PPP applications, and some banks had more efficient PPP operations than others. The CARES Act appropriation ran out on April 16, freezing new

loan activity until Congress appropriated an additional \$310 billion on April 24 and lending resumed on April 27. These delays create an opportunity to compare firms that received their PPP loans earlier and later. Relative to the cutoff approach, this research design can encompass smaller recipients but only in the weeks and months immediately following the program's rollout.

Studies of early versus late recipients produced mixed results. Doniger and Kay (2021) found sizeable employment effects in areas with more loans processed just before the initial CARES Act allotment ran out, especially in smaller firms. Granja et al. (2020) applied a similar approach to firm and local area outcomes and found much smaller immediate employment effects, a difference they attribute to the variation in lending before the replenishment not being fully random. Faulkender, Jackman, and Miran (2020) attempted to resolve the nonrandom distribution by using county-level variation in the density of community banks, which processed loans relatively efficiently, and found large effects that they interpret as local to the small firms most likely to borrow from a community bank. However, their main results also display “pre-trends” wherein counties with higher community bank density had smaller increases in UI claims even before the PPP went into effect, highlighting the difficulty of obtaining causal estimates. Bartlett and Morse (2020) compared businesses in Oakland, CA, that applied for and received or did not receive a PPP loan as of the beginning of June and found that recipients had a self-reported 20 percentage point higher subjective probability of survival if lockdown conditions persisted for an additional six months, but this effect disappears for firms with more than 20 employees. Using data from a nationwide survey of small firms, Bartik et al. (2021) found similar effect sizes for small firms. In addition, they found that effects of receiving a loan were similar across small firms, suggesting that the choice to distribute PPP through banks which favored certain clients did not substantially reduce the program's overall impact. Moreover, banks were likely better able to distribute the funds quickly than a program directly administered by the government. This may have raised the overall impact of the program by allowing firms that were very cash constrained early in the pandemic to survive.⁷

A fourth approach attempts to match firms that received PPP loans to other firms that have similar characteristics but did not receive PPP funds or got them later. Wheat and Mac (2021) used deidentified administrative data on customers of JPMorgan Chase and compared outcomes at firms that received PPP loans in 2020 to those that received their first PPP loan in 2021. They found that the 2020 recipients increased total expenses by 42 percent in the month of receipt relative to the control group, with larger effects for smaller firms, but the difference almost fully dissipates within three months. Dalton (2021) merges

7. It is worth noting that the banks' ability to rapidly deliver PPP funds was supported by the Federal Reserve through the Paycheck Protection Program Liquidity Facility (Anbil, Carlson, and Stycznski 2021).

the PPP loan-level data with monthly administrative employment records for all establishments in the Quarterly Census of Employment and Wages. Using a dynamic event study design that compares recipients to observationally similar firms that received a loan later or never received a loan, Dalton found employment effects in the neighborhood of 4 to 6 percent, with larger effects for smaller establishments. Dalton went on to find positive employment effects at the end of his sample (seven months after receipt), suggesting the longer-run average cost per job could be lower than his headline range of \$20,000–34,000 per employee-month retained.⁸ While these studies are the most optimistic for the efficacy of PPP, they rely on the crucial assumption that 2020 PPP recipients would have evolved similarly to 2021 recipients or to non-PPP recipients absent the program. This assumption could fail if, for example, the firms that did not apply during the summer of 2020 did not expect to meet the payroll criteria for loan forgiveness, perhaps because they did not expect to reopen.⁹

Taking stock, three main lessons emerge. First, across research designs, evidence on both the use of funds and employment effects suggest very limited impact of the PPP on employment at larger firms in the months following receipt. This suggests the program could have accomplished its employment objectives at a much lower cost, for example by capping the maximum loan size at well below \$1 million.¹⁰ Second, some studies find evidence of an impact on smaller businesses in the months immediately following receipt, although nothing in the range of the statutory requirement that 60 percent of the funds be spent on payroll. This highlights the lesson that—because money is fungible—even programs with strict employment requirements such as the PPP may not have large effects on employment. In this case, businesses used much of the PPP funds for items other than payroll, such as paying down debt. Third, there is as yet no evidence of a positive effect of PPP on employment or firm survival in the medium to long run. This will be an especially important area for future research.¹¹

8. This cost per job applies only to jobs directly impacted by the PPP. In other contexts total employment effects tend to be larger than the direct effects (Chodorow-Reich 2019).

9. In the extreme, suppose that all firms that applied for and received PPP in the summer of 2020 did so knowing that they would meet the payroll requirement irrespective of whether they received a loan and that nonapplicant firms did not apply because they knew they would have to reduce their payroll irrespective of loan receipt. Then a comparison of these groups of firms would indicate a positive effect of PPP receipt on employment even though PPP had no causal impact and all of the employment at recipients was inframarginal.

10. Notably, smaller loans account for an even higher share of loans and loan amount to self-identified Black or African American recipients. Of total PPP loans to this group, 96 percent by number and 75 percent by amount were for less than \$25,000, and only 7 percent of the amount was made in loans of more than \$500,000.

11. Autor et al. (2022) extended the 500-employee cutoff design through December 2020 and found the employment differential had fully disappeared by the end of that month.

SBA Forbearance and the EIDL Program

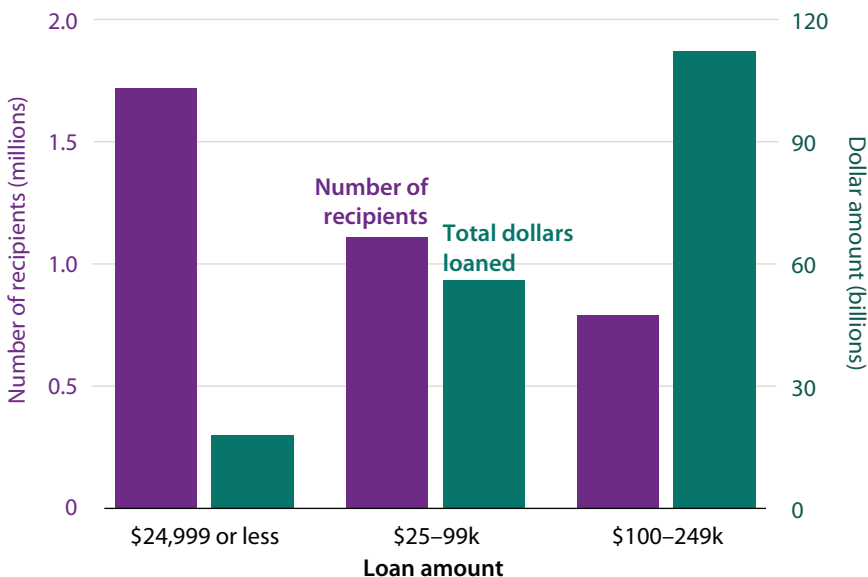
Beyond the PPP, the SBA has been involved in two main programs that directly support small businesses in response to COVID-19. The first was a forbearance program in which the SBA was authorized to pay six months of principal, interest, and fees for all 7(a), 504, and microloans. This relief was provided automatically to all SBA loans that were fully disbursed prior to September 27, 2020, and were in regular servicing status. SBA loan forbearance was originally provided as part of the CARES Act in March 2020, with a total of \$17 billion available for relief. Initially, it was uncertain how many businesses would seek and obtain new SBA loans prior to the September 27 deadline; hence, it was unclear how much of the \$17 billion allocated would be used to provide forbearance. By the end of 2020 it was clear that not all \$17 billion would be needed, and as part of the Coronavirus Response and Relief Act, passed on December 27, 2020, \$11.5 billion of this amount was rescinded, reducing the total assistance from the CARES Act to \$3.6 billion. At the same time, the act allocated an additional \$3.5 billion in available funds for automatic loan relief, available for all 7(a), 504, and microloans approved before September 27, 2020, and fully disbursed after this date. Any additional funds were made available to pay the first three months of payments for loans approved after September 27, 2020, subject to availability of funds. Thus, in total, about \$7 billion in direct loan payments were made by the SBA to cover payments that would have normally been made by small businesses. The SBA forbearance program fulfills two rationales for government support outlined in the Framework for Evaluation section. First, it provided short-term liquidity to small businesses. Second, it supported bank balance sheets by providing consistent loan payments at a time when many small businesses may not have had the revenue to make payments on their own.¹² However, because forbearance was provided automatically, it likely went to many businesses that did not need liquidity and would have made payments regardless.

In addition to automatic forbearance, the SBA also offered EIDL loans to small businesses in need of liquidity during the pandemic. While the EIDL program existed prior to COVID-19, the program was expanded considerably in response to the COVID-19 pandemic. To give a sense of the size of this expansion, in 2019 total EIDL loans to businesses amounted to \$98 million. The COVID-19 EIDL program was several orders of magnitude larger, with a total of \$317 billion in loans approved across 3.9 million loans as of the end of December 2021. EIDL loans are designed to provide working capital or to repay other business debt, allowing small businesses to refinance at favorable rates. Originally, loans were available up to \$150,000, but this cap was raised to \$500,000 in March 2021 and to \$2 million in September 2021. To be eligible

12. Typically, the SBA guarantees 50 to 85 percent of an SBA loan, while the SBA forbearance program provided an effective 100 percent guarantee for the six-month period.

FIGURE 4.6

Economic Injury Disaster Loans, by Loan Size



Source: Small Business Administration n.d.b.



for a loan, a business must have fewer than 500 employees and demonstrate that it suffered working capital losses due to COVID-19. Figure 4.6 shows the number and size distribution of the first round of EIDL loans made through December 2020.¹³ Compared to PPP, the EIDL program disbursed a larger share of funds in smaller amounts, with about 96 percent by number and 40 percent of the dollar value of loans being less than \$100,000.

Importantly, the EIDL program is distinct from PPP loans, as there is no loan forgiveness expected. Businesses that obtain these loans must meet certain credit score requirements,¹⁴ post collateral for loans above \$25,000 and provide a personal guaranty for loans over \$200,000. Thus, the subsidy from the government comes in the form of a relatively low interest rate of 3.75 percent combined with long, 30-year maturities and a two-year grace period in which no loan payments are required. Given expected repayments, the Committee

13. The most recent data released by the SBA ends in December 2020, before the cap was raised above \$150,000.

14. The requirements are a credit score above 570 for loans up to \$500,000 and above 625 for loans larger than \$500,000.

for a Responsible Federal Budget (n.d.) expects losses to total only \$36.5 billion even though the program has supported \$317 billion in total loans. To the extent that the COVID-19 pandemic was a short-term liquidity event for many firms, the EIDL program was well-suited to help businesses bridge a funding gap until revenue streams could be reestablished.

In addition to the EIDL program, the SBA administered the Targeted EIDL Advance program, which provided funds to businesses in the most need. EIDL Advances have no expectation of repayment; they are essentially a no-strings-attached grant from the SBA. To qualify, a business must operate in a low-income area, have fewer than 300 employees, and demonstrate that it has lost at least 30 percent of its revenue over an eight-week period. Businesses that qualify for an EIDL Advance can receive grants of up to \$15,000 with no repayment requirement. By the middle of July 2020, EIDL Advances totaled \$20 billion across 5.8 million grants disbursed.

Combined, the SBA provided substantial aid to small businesses beyond PPP in the form of loan forbearance (\$7 billion), subsidized lending (\$317 billion in loans), and direct grants (\$20 billion). Despite the size of these programs, they have received much less attention than the PPP program in academic studies. One exception is Li (2021), who used the Census Bureau's Small Business Pulse Survey to show that the local severity of the COVID-19 pandemic was unrelated to the probability that a small business applied for or received an EIDL loan or SBA loan forgiveness, suggesting that the programs were poorly targeted. However, Li (2021) also found that firms that received SBA support were less likely to report revenue and employee hour decreases in subsequent weeks. Nonetheless, these are simply correlations seen in the data and should be interpreted with caution. It is likely that the savviest businesses were the ones that applied for SBA assistance, and they may have weathered the COVID-19 pandemic better than other firms even if they had not received SBA assistance.

Fairlie and Fossen (forthcoming) also studied the allocation of SBA assistance, with a focus on whether the PPP and EIDL programs effectively reached minority communities. They found that take-up of the PPP program was slow in many minority communities and that loan amounts were negatively correlated with the minority share across communities. Meanwhile, they found that the EIDL program was more effective in its reach, with loan numbers and amounts both positively correlated with minority communities.

Aside from the allocation of assistance, some concern has been raised about fraud in applying for SBA assistance. The Government Accountability Office (2021) found that at least \$156 million in EIDL loans had been approved for ineligible businesses, such as real estate developers and multilevel marketers. In addition, U.S. financial institutions filed more than 20,000 reports of suspicious activity related to the EIDL program. The SBA's Office of Inspector General released a report in October 2020 finding that about 46 percent of total EIDL funding through July 2020 had been released to potentially fraudulent borrowers, many of whom submitted duplicate applications from the same IP address or email address (SBA 2020). Similarly, Griffin, Kruger, and Mahajan

(2021) argue that a large number of PPP loans were released to potentially fraudulent borrowers. Given the speed and size of the programs, it is perhaps inevitable that the SBA could not put in place tight controls—at least initially. In preparation for future small business assistance, care should be given to thinking about how to scale up programs quickly without lowering the guard-rails so dramatically.

We are unaware of any academic study that clearly identifies the effect of EIDL or SBA loan forgiveness on small business performance. Nonetheless, some conclusions can be drawn. First, demand for EIDL loans was very strong, showing that the program's subsidized terms were attractive to many small-business owners. Many small businesses were willing to take on additional debt despite the uncertainty at the beginning of the pandemic, signifying at least some expectation of an ability to repay after the two-year grace period. Their demand for EIDL loans was likely affected also by the long maturity of these loans. Recent work has shown that many individuals focus on monthly payment amounts rather than interest rates or overall loan amounts when considering new credit (Argyle, Nadauld, and Palmer 2020). By stretching payments over 30 years, EIDL loans have low required monthly payments, which likely enhanced their attractiveness. As opposed to the PPP, EIDL loans have the benefit of providing liquidity now but at lower cost to the government after repayment of the loans.

Another benefit of EIDL loans is their ability to be somewhat targeted towards long-term viable firms. As laid out in the Framework for Evaluation section, one argument for government involvement in business support is that during downturns it can be difficult to separate viable from nonviable firms, leading capital providers to stop providing capital entirely. During the pandemic, government-provided liquidity via grant programs, including the PPP, targeted firms that were hard-hit by the pandemic but not necessarily those firms that also expected to be viable long term. Indeed, to the extent that the pandemic fundamentally altered some aspects of the economy (e.g., moving more commerce online), the hardest-hit firms in the short run could also be those that cannot survive in the long run. On the other hand, subsidized lending programs that force business owners to consider their ability to repay (e.g., the EIDL) or that force lenders to keep some “skin in the game” (e.g., the Main Street Lending Program [MSLP], discussed below) can provide needed liquidity while still attempting to provide capital to firms with better prospects.

Of course, the downside of providing loans to struggling businesses instead of grants is that it leaves them with more debt, which could slow economic recovery due to debt overhang. Relative to providing grants, loans create at least some debt overhang as small businesses use cash flows to repay debt instead of other potential investments during the recovery phase. The amount of debt overhang in the aftermath of COVID-19 is still unknown, but the quick recovery in the economy suggests it has not been overly severe to this point. Clearly, the non-PPP SBA small-business support programs merit closer study in the future than they have received to date.

Other Federal Subsidies

The CARES Act and subsequent legislation contained several other provisions to aid businesses. Two of the largest were the Employee Retention Credit and grants to air carriers. The Employee Retention Credit was a refundable tax credit against employment taxes equal to 50 percent of the qualified wages paid by an employer after March 12, 2020. To be eligible, employers had to experience either a full or partial suspension of operations due to a government order in response to COVID-19 or demonstrate a significant decline in gross receipts. More than \$70 billion was claimed for wages paid through 2021Q1 and a further \$31 billion after that date.

In recognition of the immediate disruption to travel, the CARES Act provided grants to air carriers based on their total payroll and required the funds to be used exclusively for employee compensation. The program disbursed \$28.6 billion to 611 passenger carriers, cargo carriers, and support contractors between April and October 2020. Strikingly, \$22 billion of this total went to just six large airlines: American (\$6.0 billion), Delta (\$5.6 billion), United (\$5.1 billion), Southwest (\$3.4 billion), Alaska (\$1.0 billion), and JetBlue (\$1.0 billion).

The academic literature has thus far paid little attention to these other programs. While both had features designed to link disbursements to payroll, the fungibility of funds raises the possibility that they may instead have benefited shareholders. Such concerns may be particularly significant for the grants to air carriers, which mostly went to large, publicly traded firms that have access to a variety of capital markets where they may have been able to access liquidity. Alternatively, the airlines could have renegotiated with their creditors either out of court or via Chapter 11 bankruptcy. Indeed, most major air carriers have previously undergone successful bankruptcy restructuring, albeit not all simultaneously. Finding a suitable counterfactual for large passenger airlines is difficult. Careful case studies of how these firms used the funds would help in assessing these programs.

Federal Reserve Programs

The Federal Reserve responded to the COVID-19 pandemic by taking unprecedented actions at unprecedented speed. It began by deploying many of the tools it used during the 2008–09 financial crisis. Specifically, on March 15, 2020, it cut the federal funds rate to a range of 0 to 0.25 percent and began large-scale asset purchases, or quantitative easing, in Treasury securities and agency mortgage-backed securities. On March 17, 2020, the Fed announced several measures to support market liquidity, including reopening many facilities first used in the financial crisis: the Primary Dealer Credit Facility, the Commercial Paper Funding Facility, and the Money Market Mutual Fund Liquidity Facility. Through their broader effects on financial markets, these steps all indirectly supported businesses.

Direct support for business credit began on March 23, 2020, when the Fed and the Treasury announced their new Corporate Credit Facilities. Under the original announcement, the Primary Market Corporate Credit Facility (PMCCF) would buy up to \$100 billion of newly issued bonds and loans from investment-grade U.S. firms. The Secondary Market Corporate Credit Facility (SMCCF) would buy up to \$100 billion of existing investment-grade bonds and loans as well as exchange-traded funds (ETFs) that held such bonds. On April 9, 2020, the Fed and the Treasury significantly expanded the scale of the two programs, increasing their total capacity to \$750 billion. It also expanded their scope, allowing the facilities to buy the bonds and loans of firms that had been investment grade at onset of the pandemic but had subsequently been downgraded.

The April 9 announcement also established the MSLP, a \$600-billion facility to make loans to firms. The program was aimed at mid-sized firms, with requirements that firm employment, revenue, and leverage not be too high. Banks made qualifying loans and sold 95 percent to the facility while retaining the remaining 5 percent. Restrictions were placed on uses of funds, and firms participating in the program were subject to restrictions on executive compensation, dividends, and share repurchases.¹⁵

The Corporate Credit Facilities

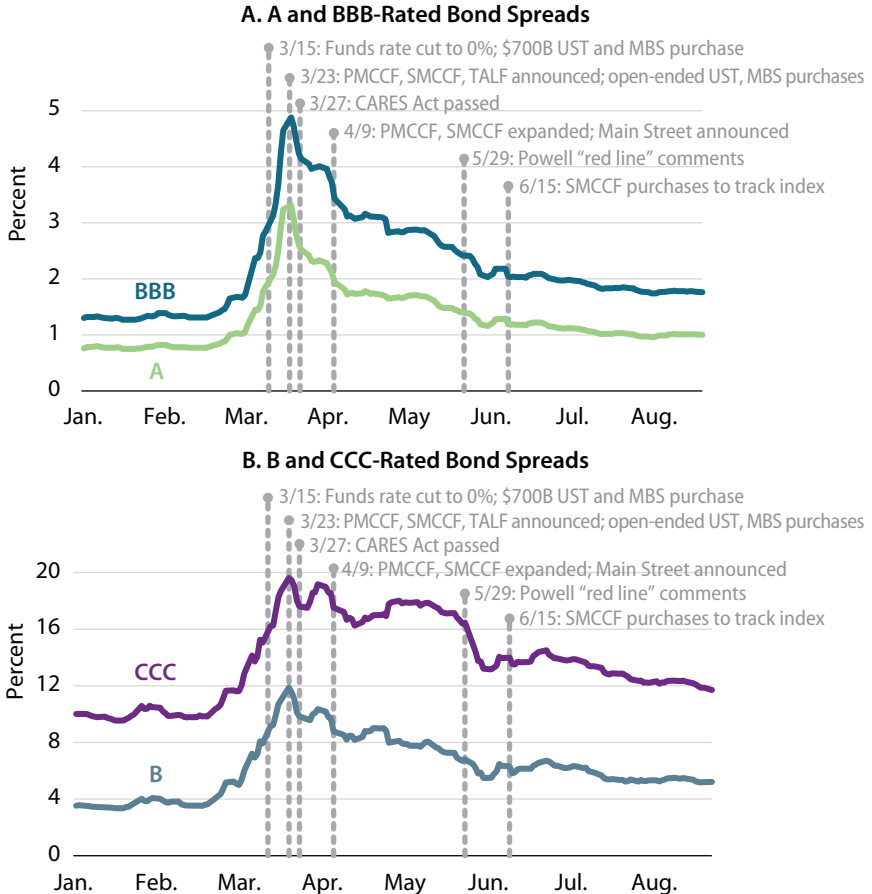
Any evaluation of the CCFs must wrestle with two facts. First, take-up was very low. As shown in Table 4.1, the CCFs used only approximately \$15 billion of their \$750-billion capacity.

Second, despite this low take-up, the CCFs appear to have had meaningful announcement effects on bond prices, as shown in Figure 4.7. Investment-grade credit spreads fell sharply after the initial program announcement on March 23, while high-yield credit spreads were more significantly impacted when the programs were significantly expanded on April 9. Spreads fell further after Federal Reserve Chair Jerome Powell's remarks on May 29: "The Fed is strongly committed to using our tools to do whatever we can for as long as it takes to provide some relief and some stability now. ... We crossed a lot of red lines, that had not been crossed before. ... This is that situation in which you do that, and then you figure it out afterward (Smialek 2020)." These price movements were accompanied by significant bond issuance by firms, which took advantage of improving market conditions to build up their liquidity buffers (Halling, Yu, and Zechner 2020).

15. While the Corporate Credit Facilities and the Main Street Lending Program were jointly designed by the Federal Reserve and the Treasury Department, press reports indicated that some of the more restrictive elements of the program design were insisted upon by Treasury. See, for example, Timiraos and Davidson (2020).

FIGURE 4.7

Corporate Credit Spreads and Select Policy Changes, 2020



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Consistent with Figure 4.7, academic studies, including Haddad, Moreira, and Muir (2021), Gilchrist et al. (2020), and Boyarchenko, Kovner, and Shachar (2021), find significant effects on credit spreads of the announcement of the CCFs when taking a simple event study approach. Yet, while event studies find

large effects, they are potentially confounded by other news about the path of the pandemic and the macroeconomy that were released around the same time. Thus, the same studies try to achieve more careful identification of the effects of the CCFs by also taking a second approach: a differences-in-differences approach that compares spreads on bonds that were eligible for CCFs purchases and bonds that were not, before and after the key program announcements. These empirical exercises find that the CCFs lowered credit spreads, but they generally found smaller magnitudes than the simple event study approach. Boyarchenko, Kovner, and Shachar (2021) also argued that purchases themselves had important effects on bond prices, over and above the simple announcements of the programs.

While the differences-in-differences approach offers more careful identification, it may understate the effects of the CCFs for two reasons. First, the programs may have had general equilibrium effects that simultaneously moved all bond prices. Second, investors may have anticipated that the programs would be expanded if market conditions deteriorated further. Thus, program announcements may have moved the prices of ineligible bonds. Haddad, Moreira, and Muir (2021) used prices of options on bond ETFs to argue that the market did indeed anticipate significant expansions of the CCFs if markets deteriorated.

In terms of the rationales articulated for government intervention in Section III, the CCFs are best rationalized as an attempt to reduce the financial frictions that prevailed in the corporate bond market early in the pandemic. Bond price declines in March 2020 were in part driven by fire sale dynamics (Ma, Xiao, and Zeng 2021; Falato, Goldstein, and Hortaçsu 2021), and the CCFs may have helped mitigate fire sale problems. Consistent with the idea that the CCFs reduced financial frictions, O'Hara and Zhou (2021) and Kargar et al. (2021) show that market liquidity improved significantly for eligible bonds.

We next turn to the potential costs of the CCFs. As discussed in Hanson et al. (2020), the expected cost of the CCFs depends in part on one's theory of disruptions in the corporate bond market. It could be the case that bond market fire sales are akin to bank runs—that there are multiple equilibria, a “bad” fire sale equilibrium with low asset prices in which many investors try to fire sell their bonds and a “good” equilibrium featuring high prices and few sales. Under this multiple equilibrium view, the CCFs take little risk.

In contrast, it could be the case that there are not multiple equilibria, but government actions still have benefits. For instance, suppose that losses could be borne either by the government, in which case they must be financed by future taxation, or by the private sector, in which case they are amplified by private sector financial frictions and spillovers. If the distortions associated with taxation are relatively low and private sector frictions are relatively high, then government intervention may be warranted, but it is not a free lunch (Hanson, Scharfstein, and Sunderam 2019).

The low take-up and large price impact of the CCFs are not sufficient to distinguish between these two views. Under the multiple equilibrium view, the very existence of the CCFs shifted markets from the bad equilibrium to the good one, like deposit insurance in the canonical Diamond and Dybvig (1983) treatment of bank runs. Thus, there are large benefits to government intervention in terms of prices and market functioning, even though utilization of the facilities is low.

However, low take-up and large price impact are also consistent with the idea that there are not multiple equilibria. Instead, the government opened itself up to significant risk taking through the CCFs, but that risk did not realize due to the path of the pandemic. Haddad, Moreira, and Muir (2021) used prices of options on bond ETFs to argue that the market anticipated that the government could take significant losses on its bond purchases if the economic impact of the pandemic had been worse.

Given the rationales articulated in the Framework for Evaluation section, it is worth noting that the CCFs targeted large firms with access to public markets. While the financial frictions these firms faced were likely more severe during the initial stages of the pandemic than normal, they were also likely much less severe than the financial frictions faced by smaller firms. In other words, the CCFs were not targeted toward firms facing the most significant financial frictions. Nonetheless, since public firms are large employers with large macroeconomic impacts, interventions targeted at them may have relatively large benefits.

Taking stock, the key lesson of the CCFs is that it is possible for the government to play a major stabilizing role in bond markets and reducing financial frictions. The critical open question is whether doing so is desirable. In the COVID-19 crisis, large benefits were obtained at low cost with low take-up, but those outcomes were in part due to the path of the pandemic. Had the pandemic more strongly affected the economy in late 2020 and early 2021, the costs of intervention may have been significantly higher. The costs and benefits of such intervention in future market disruptions are uncertain.

The Main Street Lending Program

We next turn to the MSLP, which targeted smaller firms than the CCF. As shown in Table 4.1, like the CCFs, the MSLP had very low take-up. It used just over \$18 billion of its \$600 billion capacity.

A key design feature of the MSLP was the way that banks and the government shared risk. Banks sold 95 percent of qualifying loans to the facility while retaining a 5 percent slice of the loan with the same risk (i.e., a “pari passu” loan participation) on their balance sheets. This design choice meant that loans made under the MSLP had to offer similar returns to other loans banks were willing to make. In other words, the MSLP did not encourage subsidized lending. Though banks only had to retain a fraction of the loans, they had to

earn a satisfactory return on the retained portions. And since banks and the government shared risk and repayments proportionately, the overall returns on MSLP loans were similar to the returns on the bank-retained portions.¹⁶

When would banks find a facility with such a design useful? At times when banks are highly balance-sheet constrained but when there are many loans on which banks could earn a satisfactory return. At such times, the MSLP would expand the size of banks' effective balance sheets. At the onset of the pandemic, there was a considerable chance that banks would become capital constrained. As documented by Chodorow-Reich et al. (forthcoming), Greenwald, Krainer, and Paul (2021), and Kapan and Minoiu (2021), there were significant drawdowns of bank credit lines in the early stages of the pandemic. Greenwald, Krainer, and Paul (2021) argued that drawdowns may have changed decisions about new lending, suggesting that balance-sheet constraints may have entered banks' calculus. In addition, Acharya, Engle, and Steffen (2021) showed that banks with larger drawdowns suffered particularly large stock price declines. However, as shown in Figure 4.8, neither bank stock prices nor bank capital ratios declined as significantly during the pandemic as they did during the global financial crisis, and they recovered from their lows far more quickly. For instance, bank regulatory capital declined 29 percent peak-to-trough in the global financial crisis, compared with 7 percent during the pandemic.

In terms of the rationales for intervention outlined earlier in the chapter, the MSLP is best rationalized as an attempt to reduce the potential financial frictions in the banking sector. There is a rich body of literature demonstrating that bank capital supply shocks can negatively impact firm investment and employment (e.g., Bernanke 1983; Bernanke and Lown 1991; Peek and Rosengren 1997; Ashcraft 2005; Khwaja and Mian 2008; Ivashina and Scharfstein 2010; Chodorow-Reich 2014). Furthermore, these impacts tend to be particularly severe for smaller firms without access to public capital markets, and the MSLP focused on such firms.

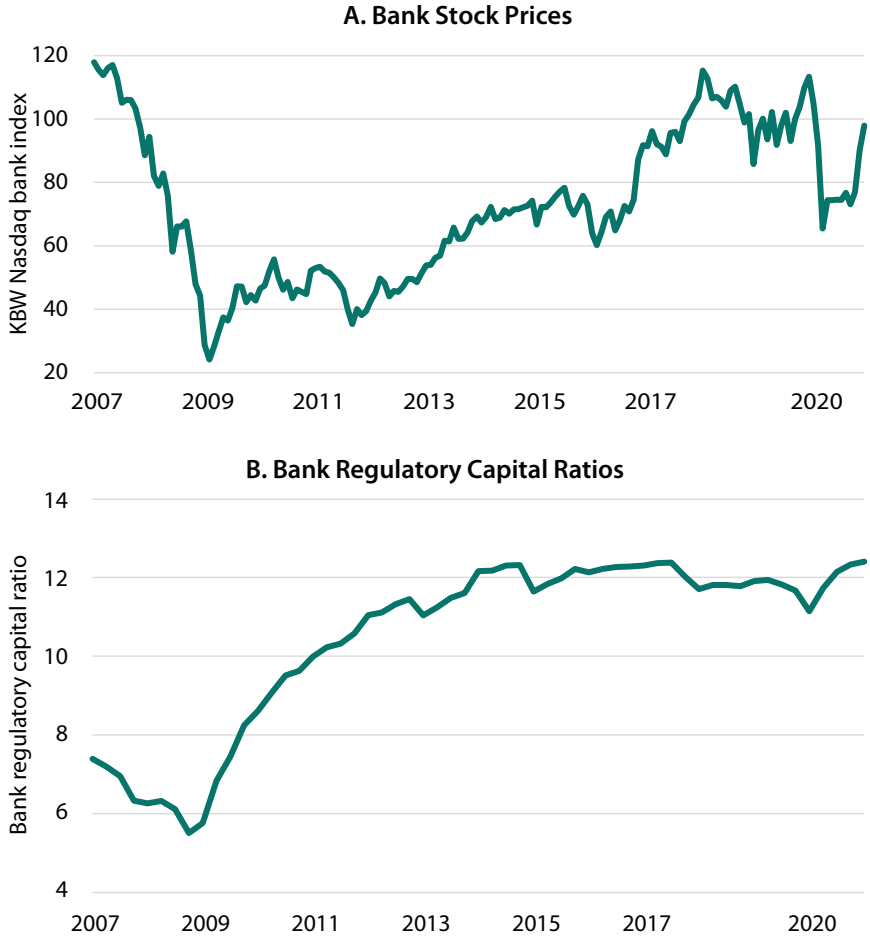
Taking stock, the key lesson is that the MSLP could have had a larger impact if the pandemic's effect on the macroeconomy and the banking sector had been more severe and more protracted.¹⁷ The key open question is whether other tools for shoring up bank balance sheets could achieve the same goals at lower cost. For instance, increasing the amount of bank equity would also improve the health of their balance sheets and support additional lending. In

16. The returns were not exactly the same, because the banks received origination and servicing fees, while the government did not.

17. Since market prices are generally not available for bank loans, it is difficult to study announcement effects of the MSLP in the way that the academic literature has for the CCFs. Nonetheless, Minoiu, Zarutskie, and Zlate (2021) argue that the MSLP may have been perceived by banks as a backstop. As such, banks may have lent more at the initial stages of the pandemic because they understood that future lending would be supported by the MSLP.

FIGURE 4.8

Bank Stock Prices and Regulatory Capital Ratios, 2007–2020



Source: Nasdaq n.d.; Federal Reserve Board n.d.

Note: Panel A shows the evolution of the KBW bank index, a capitalization-weighted index of 24 stocks that is designed to track the performance of U.S. money center and regional banking firms. (The index does not include traditional brokerage firms like Goldman Sachs and Morgan Stanley that are now organized as BHCs.) Panel B shows the risk-based capital ratios of U.S. publicly traded BHCs from 2006Q1 to 2020Q1 using data from Form FR Y-9C. Specifically, we plot the Tier 1 capital ratio (the ratio of Tier 1 Capital to Risk-Weighted Assets) and the CET1 ratio (the ratio of Common Equity Tier 1 Capital to Risk-Weighted Assets). Prior to 2014Q1 (for Advanced Approaches BHCs) or 2015Q1 (for all other BHCs) when Common Equity Tier 1 Capital is first reported on the FR Y-9C, we constructed a proxy for Common Equity Tier 1 Capital (sometimes referred to as Tier 1 Common Equity) by taking the appropriate deductions from each BHC's reported Tier 1 Capital.

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the next crisis, the government could encourage higher amounts of equity in the banking system in two ways. First, as argued by Greenwood et al. (2017) and Blank et al. (2020), it could use the bank stress tests as a regulatory tool to encourage banks to raise equity from capital markets. Second, in a more severe crisis, the government could directly inject equity into the banking system, as it did during the global financial crisis. Encouraging banks to raise equity from capital markets minimizes the government's risk exposure and involvement in bank operations. In contrast, when the government injects equity itself, a host of governance problems can arise. The MSLP sits between these extremes. The government is still involved, but it avoids some of the governance problems involved with direct equity ownership.¹⁸

State and Local Programs

While our focus is on the federal support programs, we note that all states and many counties and cities created programs to provide grants or below-market-rate loans to private businesses. Funding for these initiatives came from the CARES Act Federal Coronavirus Relief Fund, from other federal sources, and from state and local government tax revenue. We collected information on state-administered business relief programs through internet searches and list the total amount disbursed in Table 4.1. State grant and fee offset programs total \$14.7 billion, with more than half of the financing coming from the CARES Act. Notably, many of these initiatives had caps of \$100,000 or less and employment caps well below 500, making them much more targeted toward small businesses than the federal PPP. While these programs were much smaller than the federal programs, they may have offered more “bang for the buck” by focusing on those businesses that faced the largest financing frictions.

Other Factors Impacting Businesses

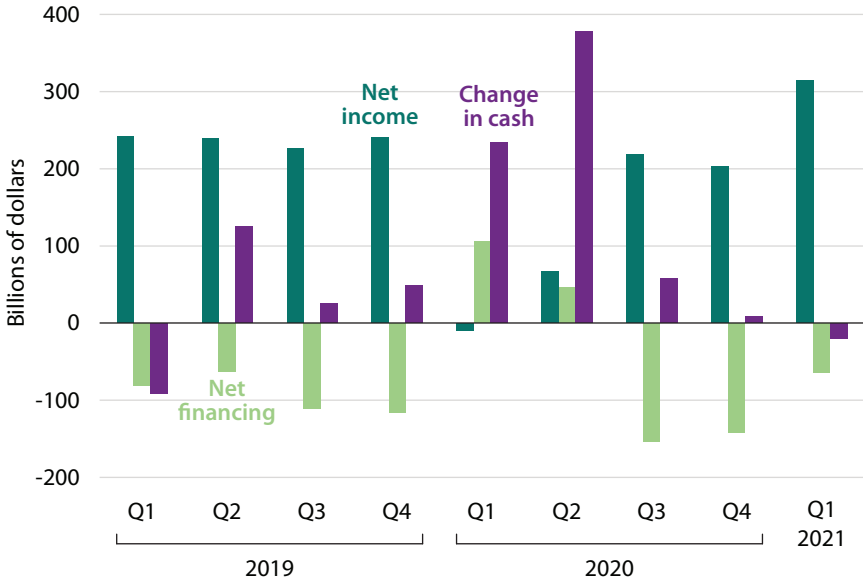
The CCFs and the MSLP were designed to support relatively large firms through the pandemic. Given that these facilities saw relatively little use, the question arises: how did these firms weather the pandemic? We study this question using Compustat data on nonfinancial firms. Notably, while Compustat is restricted to relatively large firms with publicly issued equity or debt, the patterns uncovered may also help to shed light on the experience of smaller firms.

Figure 4.9 shows that prior to the pandemic, Compustat nonfinancial firms in total earned large positive net income of over \$200 billion per quarter. On average, they did not accumulate additional cash and they used their profits

18. It does not avoid all such problems, however. For instance, for programs like the Main Street Lending Program, there are important questions about whether the government or the originating bank should have control rights if loans default.

FIGURE 4.9

Quarterly Net Income and Financing for Nonfinancial Public Firms, 2019Q1–2021Q1



Source: Compustat n.d.

Note: Cash is defined as cash and short-term equivalents; net financing is defined as net stock issuance (issuance minus repurchases) plus net debt issuance (issuance minus retirements) minus dividends.

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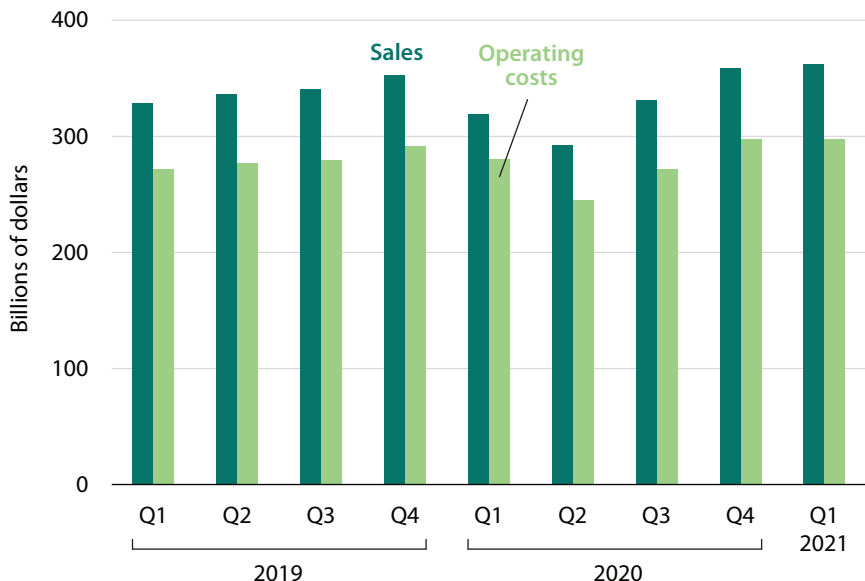
to reduce their outstanding net financing; that is, on average, they retired debt and repurchased equity. Total net income then fell sharply with the onset of the pandemic in the first quarter of 2020 and remained low in the second quarter. At the same time, firms increased their issuance of net new financing and built up their cash buffers.¹⁹ This behavior is consistent with the idea that firms feared a prolonged downturn at the beginning of the pandemic. However, firms' fears were not realized, as Figure 4.9 shows that net income recovered to its pre-pandemic level by the third quarter of 2020.

Why did net income not fall further at the height of the initial pandemic-related lockdowns? As Figure 4.10 shows, firms were able to reduce operating costs as their sales fell. A significant portion of this cost adjustment likely occurred

19. The change in cash is larger than the sum of net income and net new financing. The difference reflects (a) the conversion of noncash assets to cash; (b) depreciation, which shows up in net income but is not a cash expense; (c) trade credit (i.e., firms stretching their accounts payable and cutting their accounts receivable); and (d) capital expenditures.

FIGURE 4.10

Sales and Operating Costs for Nonfinancial Public Firms, 2019Q1–2021Q1



Source: Compustat n.d.

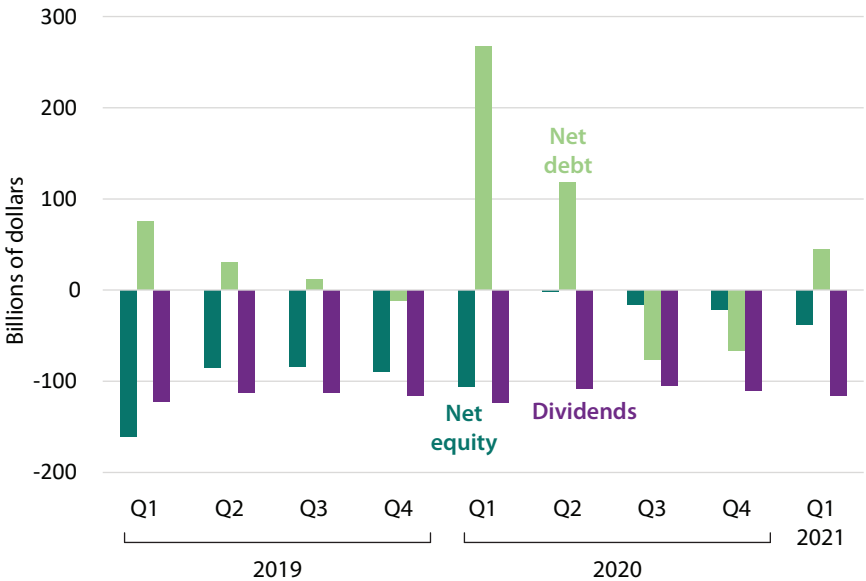
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through payrolls. This highlights the fact that there are two potential paths for the government to support households and firms. First, as in the U.S. unemployment insurance scheme, firms can lay off workers to reduce costs and the government can then provide direct aid to workers. Second, in schemes like the PPP, firms can retain workers and the government can help offset the costs of payroll.

How did firms increase their cash and net new financing early in the pandemic? Figure 4.11 breaks total new financing of nonfinancial firms in Compustat into three categories: net new equity issuance, net new debt issuance (including interest payments), and dividends paid to equity. Prior to the pandemic, dividend payments exceeded \$100 billion each quarter and equity repurchases averaged \$100 billion per quarter. Net debt issuance was generally small but positive. Figure 4.11 shows that equity repurchases (negative net equity issuance) shrank dramatically with the onset of the pandemic while dividend payments remained stable. Firms raised over \$250 billion of new debt financing in the first quarter of 2020. This debt came from two sources: capital markets and drawdowns of credit lines. Additional debt financing was raised in the

FIGURE 4.11
Net Financing for Nonfinancial Public Firms,
2019Q1–2021Q1



Source: Compustat n.d.

Note: Net financing is defined as net stock issuance plus net debt issuance minus dividends.

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second quarter of 2020, and firms started to repay this financing at the end of 2020 as the economic outlook improved. Importantly, this reflects capital raising only by firms in the Compustat dataset, which are larger firms that have access to public capital markets. Smaller firms likely found it somewhat more difficult to raise capital during this time, which again highlights the importance of targeting programs such as PPP and EIDL loans to those firms.

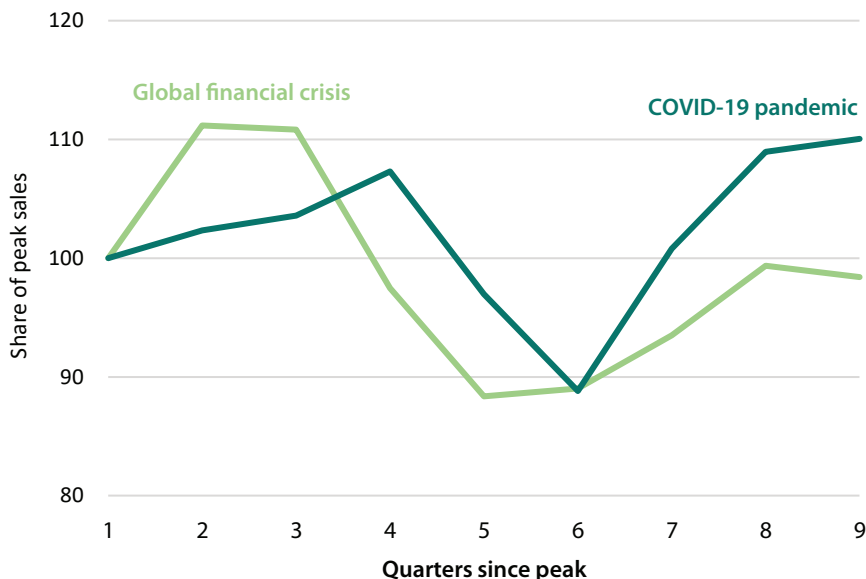
Why was the recovery in net income so fast in 2020? Figure 4.12 compares the evolution of sales (revenues) during the pandemic and the global financial crisis (GFC). The figure shows that the aggregate drop in sales for nonfinancial firms was similar in both recessions, but sales recovered much more quickly during the pandemic.

Conclusion

We have evaluated the main business aid programs deployed by the U.S. government during the COVID-19 pandemic. Our focus has been understanding

FIGURE 4.12

Sales for Nonfinancial Public Firms, Indexed to Recession Peak



Source: Compustat n.d.

Note: The global financial crisis is indexed to 2008Q1 and the COVID-19 pandemic to 2019Q1.



the potential for such programs to help speed recoveries from future non-pandemic-related downturns. The main conclusion is that policymakers should not automatically interpret the rapid recovery from the pandemic as evidence that business aid programs have strong economic benefits. Many careful studies found that these programs had relatively small effects, suggesting that other factors including the nature of recovery from a temporary lockdown and general support for households likely played a more important role. There may be circumstances in which small-business lending programs like the EIDL or bond market stabilization programs like the CCFs could prove useful—for instance, in cases in which other support for households is less generous—but they should be judiciously deployed. The speed at which support programs were deployed during the COVID-19 pandemic was admirable. However, given the rapid rollout, it is not surprising that some of the programs were not well-designed to achieve maximum impact.

Four concrete lessons emerge from our analysis of business support programs in the COVID-19 pandemic. First, policymakers should not blindly redeploy the 2020 tool kit. Second, support for small businesses, like the PPP,

could have been restricted to significantly smaller firms. For instance, the employment cap for program eligibility could have been set at 50 or 100 employees, instead of 500, without adversely affecting the program's overall impact. Third, support for large firms, such as publicly traded airlines, should be treated skeptically because these firms have access to many forms of financing and can be efficiently processed by the bankruptcy system. Finally, while the Federal Reserve clearly can support banks and corporate credit markets, whether it should do so involves careful consideration of the reason for a decline in credit.

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Lessons Learned from Housing Policy during COVID-19

Many American renters and homeowners with mortgages experienced significant distress during the COVID-19 pandemic, and the government responded with a variety of policies. We describe and evaluate these policies in this chapter. In 2019, there were 123 million occupied housing units in the U.S., of which 44 million were rented and 79 million were owner-occupied. Roughly two-thirds of owner-occupied units had mortgages (Census Bureau 2019; see Table 5.1). Data from before the pandemic show that homeownership and renting households differ significantly: the median homeowner had higher annual income and substantially more wealth than the median renter, as Table 5.1 below shows. Households that spend more than 30 percent of their income on housing are considered housing cost burdened according to the Department of Housing and Urban Development's definition. Nearly half of all renters were housing cost burdened compared to slightly more than 20 percent of homeowners.

During the pandemic, homeowners benefited from a run-up in house prices; renters did not. Declining interest rates allowed many homeowners to refinance their mortgages, thereby reducing their housing costs; renters did not have that option. Rents fell slightly below trend for a few months early in the pandemic and then accelerated. Renters were more likely than homeowners to work in industries most vulnerable to COVID-19: food and accommodation, construction, entertainment, retail, and other services.

This chapter is in two parts.¹ The first describes the circumstances of mortgage borrowers and the aid the government provided to them. The second does the same for renters.

When the pandemic struck in early 2020, homeowners had substantially more equity in their homes than they did at the start of the Great Recession, leaving them in better financial shape than they were then. Also, in contrast to

1. The authors are grateful to Mitchell Barnes, Eric Hardy, and Moriah Macklin for providing excellent research assistance. The authors thank Marcus Casey, William Fischer, Raven Molloy, Jenny Schuetz, participants in the October authors' conference, and the editors of this volume for their insightful feedback. The views expressed in this chapter are those of the authors and do not reflect the views of The Federal Reserve Board or Urban Institute, its funders, or trustees.

TABLE 5.1

Comparison of Homeowners and Renters, 2019

	Owners	Renters
Percent in the five most vulnerable industries	30.3%	37.9%
Median income	\$81,000 overall; \$96,000 with a mortgage, \$58,100 without a mortgage	\$42,000
Median wealth	\$255,000	\$6,300
Total number	78,791,325	44,011,579
Percent cost-burdened	21%	46%
Percent severely cost-burdened	9%	24%

Source: Census Bureau 2019; Board of Governors of the Federal Reserve System 2019; authors' calculations.

Note: The five industries in which employment was most vulnerable to COVID-19 were food and accommodation, construction, entertainment, retail, and other services.



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the Great Recession, homeowners benefitted from steadily rising house prices throughout the pandemic. As the mortgage borrowers' section of this chapter details, homeowners who lost income during the pandemic benefited from the substantial aid to households provided by the federal government through expanded unemployment insurance and Economic Impact Payments (EIPs) (see Chapters 2 and 3). On top of that, Congress in March 2020 declared that anyone with a federally-backed mortgage (nearly two thirds of all borrowers) who suffered financial hardship due to the pandemic could postpone mortgage payments for up to 12 months without penalty (forbearance); many servicers of mortgages not backed by the federal government voluntarily did the same. In addition, mortgage rates fell, in part because of actions by the Federal Reserve, allowing many homeowners to reduce their monthly payments by refinancing their loans. The authors find that Black and Hispanic borrowers were far less likely to refinance—even after controlling for such factors as credit scores, loan-to-value ratio, income at origination, loan amount, and the potential size of savings from refinancing. They also find that while minority and low-income borrowers were much more likely to miss payments relative to white and high-income borrowers, those who did miss payments were equally likely to take advantage of the forbearance offer. Overall, the authors conclude that pandemic-era forbearance worked well in reducing foreclosures and delinquencies, better than the mortgage modification programs of the Great Recession, both because there were fewer restrictions and because the economic environment was so different.

For renters, the story is more complicated. Federal, state, and local eviction moratoriums, while preventing dire outcomes during the pandemic, did not

relieve renters from paying past due rent. A federal \$46 billion Emergency Rental Assistance (ERA) program to help eligible households pay rent and utility bills came late in the pandemic, and the grants were slow to be distributed by state and local governments. The expansion of unemployment benefits and the EIPs, of course, helped renters who lost income during the pandemic. However, the percentage of renters who were at least one month behind on rent did rise and evictions did occur despite the substantial aid and the moratoriums. The authors conclude that the eviction moratoriums and ERA helped many who struggled to pay rent during the national health emergency. In addition, the policy response was sufficient for renters who were able to afford their rent before the pandemic and those who suffered temporary income losses during the pandemic. However, those policies did little to address the longstanding issue of lower-income families struggling to pay their rent, leaving many renters in precarious financial situations. The authors emphasize that the paucity of data about renters makes drawing firm conclusions about these pandemic-driven policies quite difficult.

Part I. Lessons Learned from Mortgage-Borrower Policies and Outcomes

Kristopher Gerardi, Lauren Lambie-Hanson, and Paul Willen

Introduction

The COVID-19 pandemic, which has proven to be the worst public health crisis in a century, has caused significant distress in the mortgage market. Widespread job loss in the early stages of the pandemic resulted in waves of missed mortgage payments. As Figure 5.1a shows, the share of loans past due approached levels last seen during the global financial crisis (GFC) and subsequent Great Recession more than a decade ago.

In this part of the chapter, we detail how the most important policy responses to the pandemic affected the mortgage market. In particular, we focus on the Coronavirus Aid, Relief, and Economic Security (CARES) Act of 2020; the follow-on American Rescue Plan (ARP) Act of 2021, which extended many of the provisions in the CARES Act; and the Federal Reserve's large-scale asset purchase (LSAP) program that was announced in March 2020. Our analysis considers the overall effects and the distributional effects of these policies on U.S. homeowners. While there are numerous ways to study the data, we will focus primarily on documenting differences across racial and ethnic groups. This decision is motivated by the fact that the COVID-19 virus disproportionately affected minority communities both as a disease and as a disruptive economic force. During the pandemic Black and Hispanic individuals were at elevated risk of infection, hospitalization, and death.² Furthermore, minorities experienced significantly worse labor market outcomes during the pandemic. For example, the unemployment rate peaked in April 2020 at 16.7 percent for Black workers versus 14.1 percent for white workers; even more concerning, though, unemployment stayed elevated much longer for minority workers than for white workers as the economy healed.³ By September 2020 the white unemployment rate had fallen by more than half to 7.0 percent, whereas in March 2021, almost a year after the pandemic started, the Black unemployment rate was still close to 10 percent (Bureau of Labor Statistics [BLS] 2022). While most of our focus

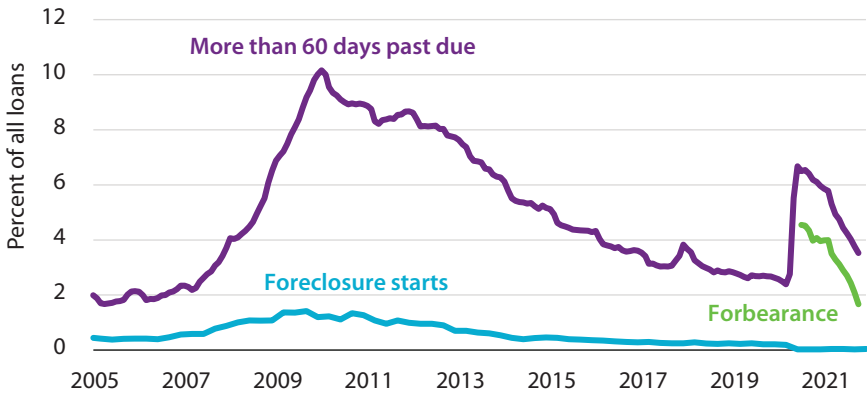
2. See Van Dorn, Cooney, and Sabin (2020) as well as Centers for Disease Control and Prevention (CDC) data on hospitalizations and death rates by race and ethnicity (CDC 2019).

3. For simplicity, we use “white” and “Hispanic” to refer to “non-Hispanic white” and “Hispanic white,” respectively.

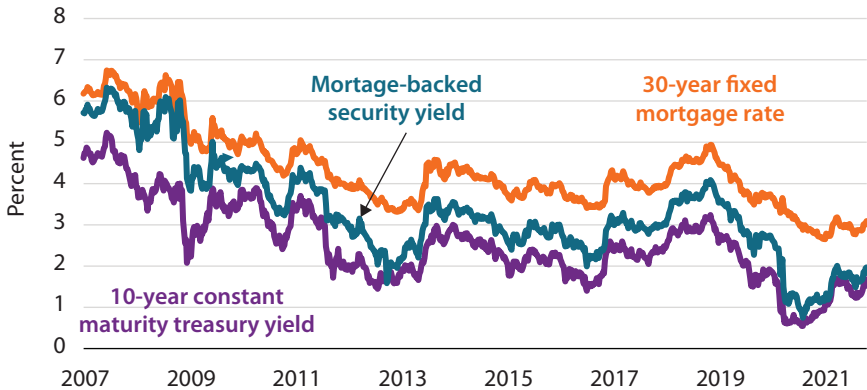
FIGURE 5.1

Mortgage Status and Interest Rates

A. Mortgage Nonpayment and Foreclosure, 2005–21



B. Interest Rates and Spreads, 2007–21



Source: Black Knight n.d.; Fuster et al. 2021; MBA n.d.a.

Note: *Panel A*: Forbearance shares include only loans 60+ days past due and in forbearance. More than 60 days past due includes all past-due loans, including loans in foreclosure. *Panel B*: FRM30 is the note rate on a 30-year fixed rate mortgage as measured by the Freddie Mac Primary Mortgage Market Survey. MBS Yield uses data from JPMorgan Markets to compute the yield on a security containing a 30-year FRM paying FRM30. 10-year CMT is the constant-maturity yield on a 10-year bond as reported in FRB H-15. For details, see Fuster et al. (2021).

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is on documenting racial disparities, we also look at differential policy effects across gender, household income levels, and county unemployment levels.

The CARES Act included a national forbearance mandate, a foreclosure moratorium, significantly expanded Unemployment Insurance (UI) benefits,

and Economic Impact Payments (EIPs) to most households. We argue that these policies were quite effective in alleviating financial distress at the outset of the pandemic and in preventing longer-run problems in mortgage and housing markets. Furthermore, we show that, although minority mortgage borrowers were much more likely to experience distress and miss mortgage payments; conditional on missing payments, forbearance uptake was similar across racial and ethnic lines.

The Federal Reserve's LSAP was focused on improving market functioning and lowering long-term interest rates. Mortgage-backed security (MBS) purchases were a significant component of the program, and Fuster et al. (2021) show that they indeed lowered mortgage rates and spurred a significant wave of refinancing. While borrowers who were enrolled in forbearance were unable to refinance, we show that a large fraction of borrowers who remained current on their loans during the height of the pandemic took advantage of the refinancing opportunity and significantly lowered their payments. Unlike the case of forbearance, however, there were large differences in refinancing behavior across racial and ethnic groups. We estimate that, through March 2021, only 10.6 percent of Black borrowers refinanced as compared with 15 percent of Hispanic borrowers, almost 19 percent of white borrowers, and 22 percent of Asian borrowers. After controlling for basic underwriting variables including credit score, loan-to-value ratio, income at origination, loan amount, as well as the potential amount of refinance savings, Black borrowers were 67 percent as likely as white borrowers to refinance.

An alternative way to measure inequality in refinances is to look at the payment savings. In Gerardi, Lambie-Hanson, and Willen (2021), we estimate that the typical refinance reduced the borrower's monthly payment by about \$280, leading to a payment reduction of \$5.3 billion per year for all households that refinanced in the first ten months of 2020. Of those savings, we estimate that only \$198 million, or 3.7 percent, went to Black households, who held 5.9 percent of mortgage debt in our sample. To put these numbers in perspective, Black households account for 13.3 percent of the population and 9.1 percent of all homeowners.

Finally, we conclude this section of the chapter with a discussion of some of the lessons that we believe policymakers should take away from the pandemic experience. We argue that forbearance was an especially effective policy in reducing borrower distress because of its timeliness, high accessibility, and incentive compatibility. However, we also acknowledge that the stars may have been all aligned as the state of the pre-pandemic housing and mortgage markets and the dynamic of the pandemic itself set up almost perfectly for forbearance to be an especially effective policy. Specifically, the rapid labor market recovery in the late spring and early summer of 2020 meant that most borrowers only needed a few months of assistance. In addition, the majority of outstanding mortgage debt (65-70 percent) was insured by the U.S. government going into the pandemic (Urban Institute 2021), including that debt held by the

most financially vulnerable segments of the market, and thus, most financially distressed borrowers had direct access to the CARES Act mandated forbearance policy. Finally, we note that the housing market was exceptionally healthy due to years of robust house price growth and low defaults and foreclosures, which meant that most borrowers exiting forbearance were not in danger of being evicted from their homes. Thus, while we argue that forbearance should remain an important tool in the policy kit going forward, it is unclear if it will be as effective in a future crisis.

Although forbearance was very effective in mitigating mortgage market distress, we argue that the Federal Reserve's LSAPs, implemented at the onset of the pandemic, had more modest effects. Although empirical evidence suggests that LSAPs lowered mortgage rates (Fuster et al. 2021) and spurred a refinancing boom in the spring and summer of 2020, most borrowers experiencing pandemic-related financial distress were likely unable to refinance. A first-order impediment was forbearance itself, as borrowers enrolled in a forbearance plan were required to exit the plan and make three consecutive mortgage payments in order to qualify to refinance. Combined with the high fees associated with refinancing, this meant that many borrowers facing financial distress and liquidity constraints related to the pandemic were unable to exploit rate declines to lower their debt burdens. This factor likely played a role in the large racial disparities in refinancing described above. We offer a few suggestions to ensure that the benefits of lower mortgage rates reach a broader set of borrowers in future downturns. These include the development and marketing of alternative mortgage products that automatically lower payments when rates decline as well as more widespread adoption of streamlined refinance programs that do not require employment or income verification.

Data

For much of the analysis in this chapter we track mortgage performance over time by borrower race and ethnicity by combining several sources of anonymized data. These sources are Black Knight McDash mortgage servicing data; Home Mortgage Disclosure Act (HMDA) data; and two credit bureau data sets from Equifax: one from Credit Risk Insight Servicing data linked to McDash data (known as CRISM) and the other from the Federal Reserve Bank of New York/Equifax Consumer Credit Panel.⁴ The McDash data provide information on loan performance, while the Equifax data allow us to observe other mortgages the borrowers have and to determine if any mortgages are in forbearance. The HMDA data enable us to identify the race, ethnicity, and gender of the borrower and to capture borrower income at the time of underwriting. We focus on 30-year, fixed-rate, first-lien loans originated during the

4. See Gerardi, Lambie-Hanson, and Willen (2021) for more information on the matching procedures and match rate.

2010 to 2019 period. Loans originated during that period made up about 75 percent of active accounts and 85 percent of active loan balances in 2019. We restrict our sample to mortgages secured by owner-occupied, single-family homes and condos. We further limit the sample to Federal Housing Administration (FHA) loans and conventional loans held by Fannie Mae or Freddie Mac (government-sponsored enterprises, or GSEs). Although we exclude portfolio and private-label securitized loans from our analysis, they make up less than 35 percent of loans active during the pandemic. As An et al. (2021) show, the forbearance rates of portfolio loans were similar to GSE loans, and the rates among private-label securitized loans were similar to FHA loans.

We supplement the matched data set with data from Optimal Blue (n.d.) to estimate the interest rate that borrowers in our sample would likely receive upon refinancing.⁵ To do this, we use the median interest rate locked each month by borrowers with similar credit scores and loan-to-value ratios, as captured in the Optimal Blue database.⁶ We use CoreLogic Solutions (n.d.) house price indices at the zip code, county, and state levels to analyze recent trends in home price appreciation for our mortgage sample and to calculate updated monthly loan-to-value ratios and home equity accumulation.⁷

Mortgage Market Policy Responses to the COVID-19 Pandemic

One important goal of policy during the pandemic was to alleviate household financial distress. A summary measure of the financial burden faced by a mortgage borrower is the debt service ratio (DSR)

$$DSR = \frac{m}{y}$$

where m and y are the mortgage payment and income, respectively. All else equal, an increase in the DSR makes a household worse off suggesting an increase can be a signal of distress. Borrower responses to a higher DSR can also have negative spillover effects, particularly when increases in DSRs are widespread across households. For example, borrowers can reduce spending on non-housing goods and services, reducing aggregate demand. Or they can

5. Optimal Blue (n.d.) data, as referenced throughout this chapter, is anonymized mortgage market/rates data that do not contain lender or customer identities or complete rate sheets.

6. We calculate the rate assuming the borrower pays zero points (and receives zero credits) from the lender at closing. We observe the borrower's credit score in month t in the CRISM data, and we estimate the loan-to-value ratio of their mortgage by dividing its unpaid principal balance by the estimated value of the home (Equifax n.d.).

7. We do this by adjusting the property value at origination by the growth in the CoreLogic zip code home price index. The CoreLogic county-level index is then used for loans located in zip codes for which CoreLogic does not provide an index, and the state-level index is used if neither zip code nor county data are available (CoreLogic Solutions n.d.).

default on their mortgages and weaken the financial system. Finally, borrowers can list their homes on the market and flood the market with unsold property.

Absent any policy intervention, the COVID-19 pandemic would have led to a massive fall in income and a consequent increase in the DSR. To reduce financial distress, policy makers took three actions early in the pandemic which affected the DSR. The first two, forbearance and asset purchases, lowered mortgage payments (m), the numerator, and the third, income support programs, raised income (y), the denominator.

We now discuss details of the three policy interventions.

Forbearance

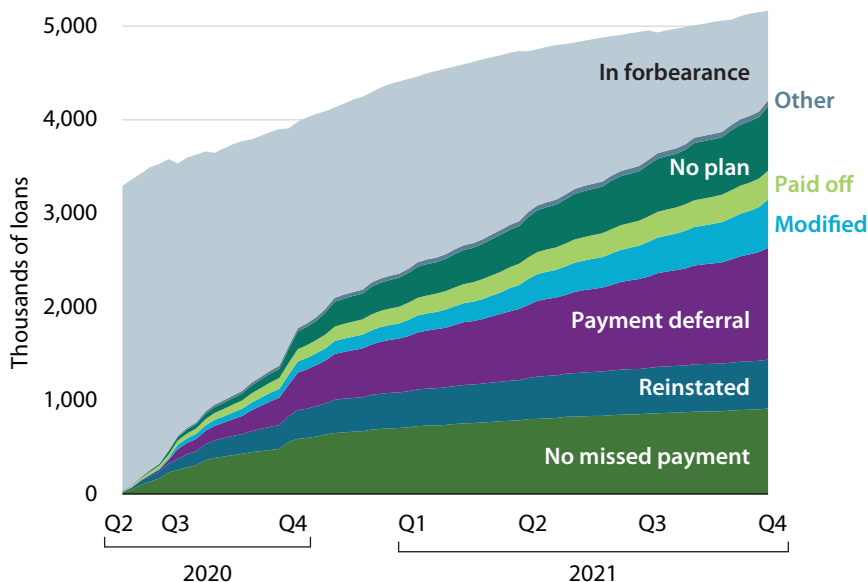
The CARES Act, passed into law on March 27, 2020, instructed lenders to allow borrowers to postpone payments for up to a year, later extended to 18 months, without incurring any penalty. Specifically, the CARES Act stipulated that any borrowers who had mortgages insured by the federal government could enroll in forbearance by simply attesting to financial hardship caused by COVID-19; households did not need to document this hardship.⁸ While the CARES Act forbearance mandate formally applied to only federally backed loans, which accounted for approximately 65–70 percent of the market at the time, servicers of portfolio and private-label securitized mortgages also routinely granted forbearance (An et al. 2021, Cherry et al. 2021).

Figure 5.2 shows the stock of loans in forbearance from the first quarter of 2020 through the third quarter of 2021. The gray area in the chart corresponds to loans that remain in forbearance, while the colored areas correspond to the stock of loans that exited forbearance in various ways. The stock of loans in forbearance peaked early in the pandemic, in the second quarter of 2020, and has been slowly declining since. The figure clearly shows that the flows into forbearance were heavily concentrated during the first few months of the pandemic. Over 80 percent of borrowers in our sample who missed mortgage payments in the first three months of the pandemic (April–June 2020) enrolled in forbearance, which suggests that the policy helped most borrowers who experienced financial distress due to the pandemic. Furthermore, previous research (Lambie-Hanson, Vickery, and Akana 2021) has shown that forbearance was concentrated among borrowers who were employed in hard-hit industries before the pandemic, such as leisure, hospitality, arts, and entertainment, as well as among households who had experienced a job disruption or income loss due to the pandemic. Interestingly, approximately one-third of borrowers who

8. Section 4022 of the CARES Act mandated that borrowers of federally backed mortgages could request forbearance for up to 12 months. It further states, “No fees, penalties, or additional interest will accrue on the loan beyond what is scheduled” (CARES Act sec. 4022 (b)(3)). In February 2021 the Biden administration extended the CARES Act forbearance mandate through June 2021.

FIGURE 5.2

Forbearance Outcomes by Exit Code



Source: MBA n.d.c.; authors' calculations.

Note: "In forbearance" measures the stock of all loans in forbearance at a moment in time. All other data series are cumulative exits.

Note that the MBA cannot distinguish between new entrants and re-entrants to forbearance. Thus the same loan may appear twice in the sample. For example, most of the loans that exited with "No plan" most likely re-entered forbearance meaning that at the end of the sample, many loans appear in both "No plan" and "In forbearance." The MBA also does not track loans after the end of forbearance so, for example, many of the "No missed payments" loans may have refinanced after exit but will not show up in the "Paid off" category. Size of surveyed universe varies but is typically around 38 million loans per week. A small number of borrowers exited using a repayment plan and those are included in the "Other" category. The first week of data is from May 31, 2020.

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enrolled in forbearance during this period stayed current on their mortgage payments, which suggests that forbearance was also widely used by non-distressed borrowers as a form of insurance against employment uncertainty during the initial stages of the pandemic.⁹

The CARES Act further stipulated that forbearance resulting from the pandemic could not negatively affect a borrower's credit score, which meant that lenders were not allowed to report borrowers in forbearance as being delinquent

9. The fraction of borrowers in forbearance but who were current on their mortgage payments quickly declined to trivial magnitudes in the second half of 2020.

on their payments. We show in section 3.3 that this stipulation largely prevented significant declines in the credit scores of borrowers who missed payments.

The CARES Act also included a moratorium on foreclosures. Initially, the moratorium only went through May 17, 2020, but it was extended twice and finally expired on July 31, 2021. For borrowers covered by the CARES Act forbearance provisions, the moratorium was largely irrelevant because forbearance prevents *any* action by the lender against a past due borrower. However, the moratorium did help borrowers who had payment problems that pre-dated the pandemic stay in their homes.

Asset Purchases

The first mortgage market policy response to COVID-19 came from the Federal Reserve. On March 3, 2020, the Federal Open Market Committee (FOMC) cut the Fed Funds target rate by 50 basis points. Less than two weeks later, on March 15, the FOMC cut the rate by an additional 100 basis points taking it essentially to zero. In addition, on the same date, the FOMC initiated large-scale purchases of both mortgage-backed securities (MBS) and Treasury securities. It initially committed to purchasing at least \$200 billion of MBS and \$500 billion of Treasury securities. Panel B of Figure 5.1 shows that following these activities, the 10-year, nominal Treasury rate fell below one percent for the first time on March 20 and MBS yields also fell to historically low levels.

Mortgage rates also fell but more slowly than Treasury rates or MBS yields. The Freddie Mac Primary Mortgage Market Survey (PMMS) 30-year fixed-rate mortgage rate fell at the beginning of March reaching a historic low of 3.29 percent (Freddie Mac n.d.). However, disruptions in the MBS market caused the PMMS rate to rise later in the month. Fed interventions in the MBS market meant that rates fell again in the beginning of April. However, as documented by Fuster et al. (2021), capacity constraints among originators meant that the spread between the primary market rates charged by originators and rates in the MBS market remained wide for an extended period, as illustrated in Panel B of Figure 5.1. Rates were historically low but most likely about 20 or 30 basis points higher than they would have been in the absence of binding capacity constraints in the mortgage origination industry, driven by a shortage of qualified workers and operational frictions such as how to complete appraisals and closings while maintaining social distancing.

Not surprisingly, historically low interest rates led to a wave of refinancing. In March 2020, the Mortgage Bankers Association (MBA) refinance index increased to its highest level in more than a decade and remained elevated throughout the entire year (MBA n.d.b.).

Income support

In addition to its direct effect on the mortgage market through forbearance, the CARES Act also indirectly affected the market through direct payments to households to make up for income lost due to the pandemic. From the standpoint of households, the main program was the expanded provision of UI. The key UI provisions of the CARES Act included expanded coverage to non-salaried workers who normally do not qualify for UI, and a supplemental payment of \$600 per week per household. Figure 5.3a shows that, starting in May 2020, expanded UI was enough to ensure that aggregate personal income remained at or above its pre-COVID trend for almost every month of the pandemic through February 2022. Additional income support programs, including the Paycheck Protection Program, meant that, in fact, personal income *exceeded* its pre-pandemic trend throughout most of that period. Figure 5.3b shows that, during the GFC and subsequent Great Recession, income support programs did not play a similar role. The 2008 stimulus program did lead to an increase in income in May and June of 2008, but government assistance from September of 2008 to March of 2009, the acute phase of the Great Recession, was minimal. Congress passed the American Recovery and Reinvestment Act of 2009, which expanded UI and provided other stimulus, but those measures did not compare to relief provided by the CARES Act and subsequent legislation. In the Great Recession, personal income never returned to its pre-crisis trend.

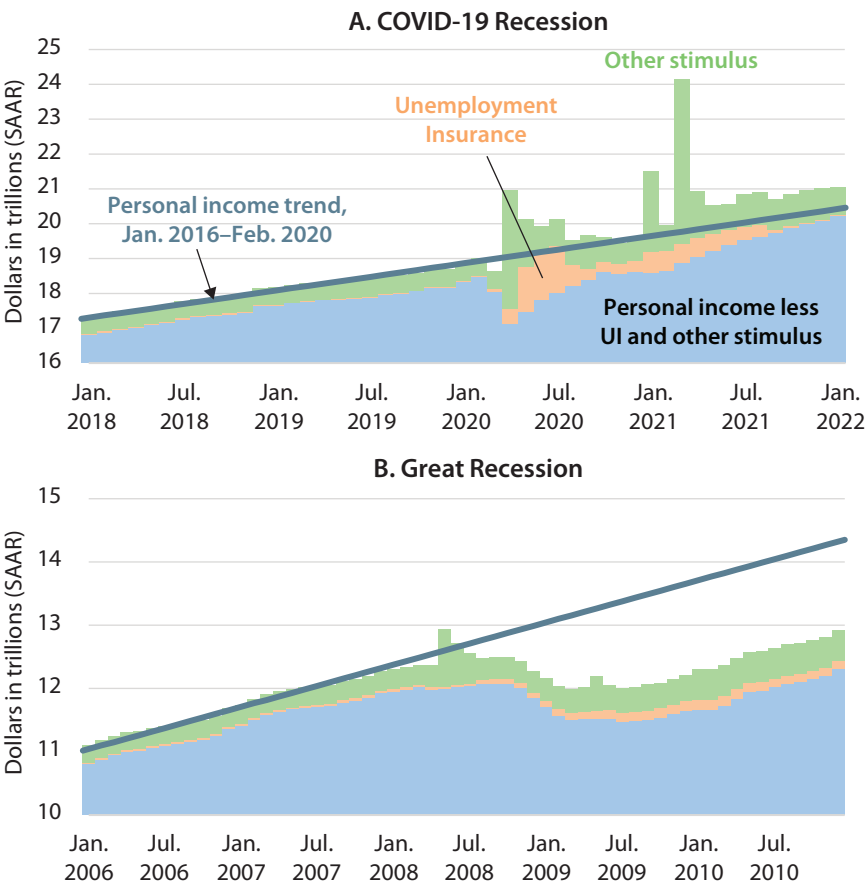
Outcomes

Policy was clearly successful at reducing household financial distress caused by income losses due to the pandemic. The orange line in Figure 5.4a shows the mortgage DSR, as defined by the Federal Reserve Board as the ratio of scheduled mortgage payments relative to personal disposable income from the National Income and Product Accounts.¹⁰ The figure shows that the DSR fell by about 55 basis points or roughly 13 percent over the four quarters from the first quarter of 2020 to the first quarter of 2021.

Why did the mortgage DSR fall during the crisis? In Figure 5.4a, we conduct a series of counterfactual experiments to illustrate how policy improved household budgets. Starting from the top, the area labeled “income loss” shows what would have happened without any direct assistance from the government. The DSR would have gone up by about 20 basis points and then drifted down as the economy recovered. Our next counterfactual isolates the effect of policy by asking what would have happened if income had remained at its pre-pandemic level and borrowers had benefited from the policy changes. The area labeled “forbearance” shows that forbearance would have lowered the DSR

10. For details see Federal Reserve Board (n.d.).

FIGURE 5.3
Personal Income after Great Recession and COVID-19 Recession



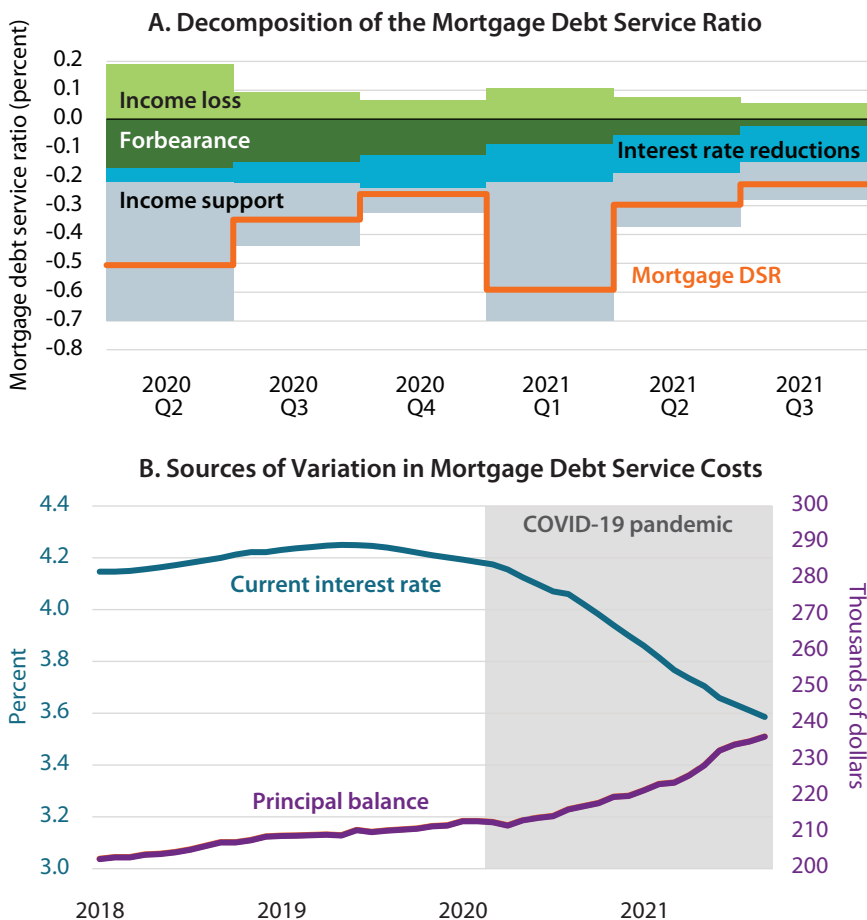
Source: BEA 2022.

Note: Time trends are based on linear regressions of personal income, estimated over the period from January 2016 to February 2020, and the period January 2004 to December 2007, for the COVID-19 and Great Recession periods, respectively. SAAR is Seasonally Adjusted Annual Rate.

initially by about 20 basis points. Visually, Figure 5.4a shows that early in the pandemic, forbearance and income loss were roughly the same size which leads to a crucial point: forbearance alone was roughly able to offset the effects of the pandemic if we measure financial distress using the debt-service ratio. Our

FIGURE 5.4

Evolution of the Mortgage Debt Service Ratio during the Pandemic



Source: Federal Reserve Board n.d.; Black Knight n.d.; authors' calculations.

Note: In Panel A, the four shaded areas represent deviations from a linear pre-pandemic trend.

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next counterfactual is to add interest rate reductions while holding income constant. The area labeled “interest rate reductions” shows that they had a similar effect to forbearance in overall magnitude. However, the timing of the benefits of forbearance and interest rate reductions was quite different. The benefits

of forbearance were front loaded and played little role by the spring of 2021, whereas interest rate reductions had little effect initially but grew over time.

Our final counterfactual experiment consists of adding income support programs to interest rate reductions and forbearance, still holding income constant at pre-pandemic levels. The area labeled “income support programs” shows that income support programs had a bigger effect on the DSR than forbearance and interest rate cuts combined in all but one quarter of the pandemic.

Overall, Figure 5.4b illustrates that the multipronged assault of different parts of the CARES Act and monetary policy meant that, using the DSR as a measure, households were actually better off after the start of the pandemic than before. Either forbearance alone or income support programs alone would have been enough to blunt the effects of the job and income losses associated with the pandemic. Of course, it is important to stress that our analysis ignores any general equilibrium effects of the policies. For example, without forbearance, many households would have cut spending which would have, in equilibrium, affected the time path of household income.

It is perhaps somewhat surprising that the effects of the interest rate reductions were so small. The bottom panel of the figure shows that the average mortgage rate paid by borrowers did in fact fall significantly, dropping by 60 basis points or about 15 percent over the pandemic period. But, several factors meant that lower rates did not translate into correspondingly large reductions in monthly payments. The bottom panel shows that lower rates were offset by an acceleration in mortgage balance growth. In addition, some refinancers took advantage of exceptionally low rates on 15-year mortgages and, as a result, had higher payments despite paying less interest.

What Happened to Borrowers in Forbearance?

Forbearance is fundamentally different from interest rate reductions and income support. Interest rate reductions and UI do not need to be paid back; forbearance does. An important concern of policymakers was that, when forbearance ended, borrowers would have to quickly repay the arrears they had accumulated. The institutional evidence and the data suggest that this was not a major problem. On the institutional side, the main government lending programs did not demand immediate repayment of arrears but rather offered a waterfall of different options: First, lenders offered to convert arrears into a non-interest-bearing second lien due on termination of the loan. This payment deferral option meant that the borrower could resume making monthly payments *as if* they had not missed any payments, meaning a restoration of the pre-COVID-19 status quo, at least as far as cash flow was concerned. If the borrower had suffered a permanent reduction in income due to COVID-19, lenders could then offer a modification of the existing loan in addition to payment deferral.

The data show that, for the most part, the waterfall worked as intended. Figure 5.2 uses data from the MBA Weekly Forbearance Survey (MBA n.d.c.), to track the evolution of all loans that entered forbearance, including loans that exited and then reentered forbearance. According to Black Knight, about 8 million loans have been in forbearance since the start of the pandemic. MBA's survey gives insight into 5 million of these forbearance experiences. As of October 2021, about a million loans were still in forbearance. What happened to the rest? About 700,000 loans had no plan, meaning that forbearance expired without the borrower making contact with the servicer to explore options. Although we cannot be sure, we think most of those loans subsequently reentered forbearance because data from Black Knight show that, starting in the fall of 2020, most entries into forbearance were, in fact, reentries. Another large exit category, especially in 2020, was borrowers who requested forbearance but then never actually used it and exited with no missed payments. In addition, a significant number of borrowers had missed only a small number of payments and were reinstated after repaying those missed payments. But, overall, most exits involved either a payment deferral or a modification, or a combination of the two.

Forbearance and Credit Scores

The CARES Act of 2020 includes language that protects borrowers who choose to use forbearance from experiencing a negative impact on their credit scores. Specifically, the legislation says that, if a borrower is in forbearance, the lender must report the loan as current to the credit bureaus (CARES Act 2020, sec. 4021). This stipulation dramatically affected the credit scores of borrowers who missed mortgage payments during the pandemic.

In February 2010 about 90 percent of past-due borrowers of FHA and GSE loans had credit scores (from Vantage 3.0) below 622, whereas the 90th percentile for past-due borrowers in February 2021 was 788, a super-prime score. The majority of the latter borrowers began missing payments in April and May 2020 and used forbearance under the CARES Act, which enabled them to avoid the serious damage to their scores that would normally accompany missing months of mortgage payments.

This difference in the distribution of credit scores is also partly a product of stricter underwriting in the aftermath of the GFC. Specifically, the 90th percentile score among borrowers current or up to 30 days past due was 812 in February 2010, as compared to 824 in February 2021. It is also possible that because the pandemic caused a very large swath of borrowers to become unemployed, nonpayment in the pandemic was less concentrated among low-score borrowers than it was in the GFC. Even if not entirely driven by the role of forbearance in protecting distressed borrowers' credit scores, the fact that VantageScores of distressed mortgage borrowers were significantly higher at the end of the pandemic than they were in the last crisis has important implications.

It suggests that borrowers exiting forbearance should have more robust access to consumer credit markets and a greater ability to tap their housing wealth. In addition, borrowers who are not able to cure their distress and who are forced to sell will likely face an easier return to future home ownership compared with similarly distressed borrowers a decade ago.

Distributional Impacts of Mortgage Policies

We now turn to a discussion of the distributional effects of the policies. In particular, we focus on differences in outcomes by race and ethnicity as well as by household income, household composition, and the growth in county-level unemployment rates. For our analysis of race/ethnicity we use information from HMDA and construct indicators for Black, white, Asian, and Hispanic borrowers. For our income analysis we use HMDA income, which is reported by borrowers when they file their loan applications, along with Census data on metro area income. We then compute an indicator variable for whether a borrower meets the Department of Housing and Urban Development's definition of either low or moderate income.¹¹

Mortgage Nonpayment and Forbearance

Figure 5.5a displays monthly, unconditional nonpayment rates for federally insured mortgages from January 2019 through the end of our sample in October 2021, broken down by borrower race/ethnicity, whether household income falls in the low or moderate category, and the amount by which unemployment increased in the borrower's county early in the pandemic. We use a 60-plus days past due (DPD) definition of nonpayment (i.e., at least two missed payments), which is common in the mortgage default literature. The figures correspond to the stock of mortgage nonpayments (i.e., the share of active mortgages that are at least 60 DPD in each month).

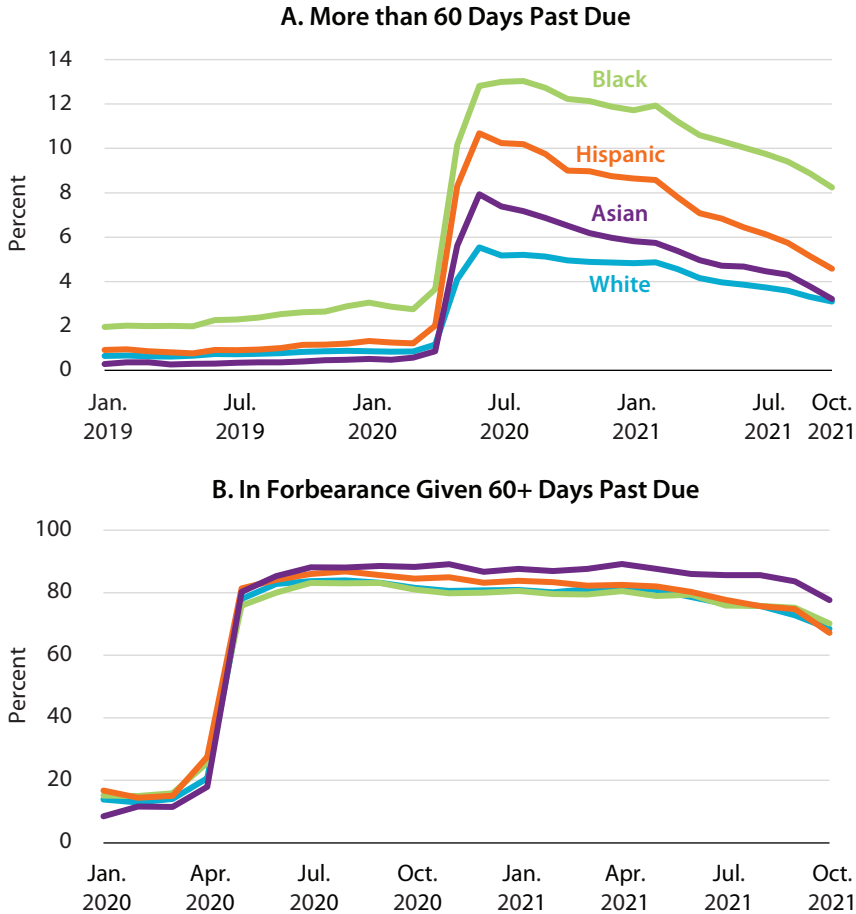
The differences across race/ethnicity in the pattern of nonpayment hazards is striking. Nonpayment rates spike for all borrowers beginning in May 2020 with the onset of the pandemic, but the increase is significantly larger for borrowers of color.¹² Black borrowers experienced the most distress; their nonpayment rates rose from around 3 percent just before the pandemic to 13 percent in mid-2020. Hispanic and Asian borrowers experienced a similarly sharp rise in nonpayments, from 1 percent to 11 percent and from 1 percent

11. HUD's definition of low income corresponds to household income being less than or equal to 50 percent of area median income, and its definition of moderate income corresponds to income that is greater than 50 percent but less than 80 percent of area median income.

12. The spike in 60 DPD in May 2020 corresponds to borrowers missing their first payment at the beginning of April and their second payment in May.

FIGURE 5.5

Households Past Due on Mortgage Payments and in Forbearance, by Race/Ethnicity



Source: Home Mortgage Disclosure Act (HMDA) data; Equifax Credit Risk Insight Servicing-McDash data; Federal Reserve Bank of New York/Equifax Consumer Credit Panel (CCP) data; authors' calculations.



to 8 percent, respectively. White borrowers experienced less distress; their nonpayment rates rose from 1 percent to 6 percent.

The time-series pattern of the stock of nonpayment rates in Figure 5.5a suggests that mortgage distress was concentrated almost entirely within a two- to three-month period at the very beginning of the pandemic. Indeed, new mortgage nonpayments for all borrowers spiked in May 2020, remained

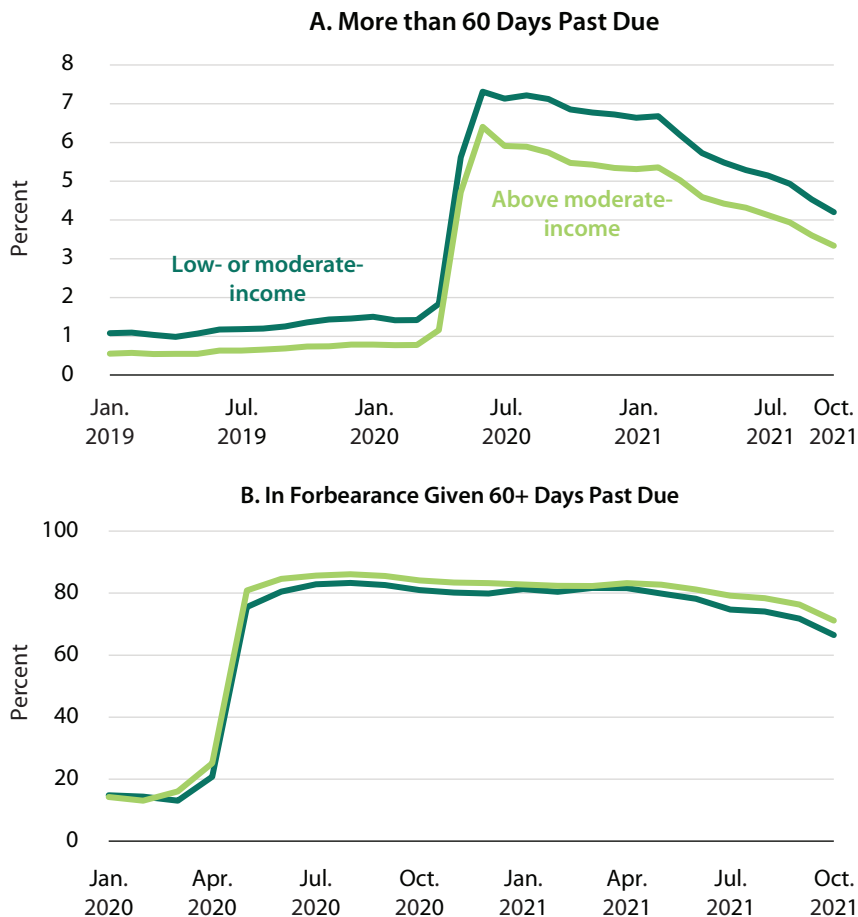
elevated in June, but then quickly declined in July. New nonpayments flattened afterward at levels that were slightly more elevated relative to their pre-pandemic levels. The fact that we see the stock of 60 DPDs stay extremely elevated through the end of the sample, despite the flows into nonpayment receding in the summer of 2020, suggests that many borrowers who experienced distress at the beginning of the pandemic were unable to quickly resolve their financial difficulties. We show below that most of those borrowers obtained relief with the CARES Act forbearance policy, and that many remained in forbearance through the end of our sample.

Figure 5.5a and Figure 5.6a clearly show that minority borrowers and lower-income borrowers experienced significantly higher levels of mortgage distress compared with white borrowers and higher-income borrowers, respectively, during the pandemic. This is not surprising, given the fact that job loss was significantly higher for minority households and that sectors characterized by lower-paying jobs like leisure and hospitality were affected more by the lockdown and social distancing measures implemented in response to the pandemic. Figure 5.7a shows that counties with top quartile increases in the unemployment rate between February and April 2020 experienced significantly higher nonpayment rates than counties in the bottom quartile over the same period, which is consistent with the idea that employment losses from the pandemic created a lot of financial distress for some mortgage holders—despite expanded unemployment insurance benefits. We now turn to an analysis of forbearance, the primary policy response to the distress in the market, to see if it had a differential impact across racial/ethnic lines or across borrowers with low versus high incomes.

Figures 5.5b, 5.6b, and 5.7b also plot forbearance rates by race/ethnicity, by income group, and by unemployment growth groups. Importantly, the figures show forbearance rates *conditional* on being behind on payments so that the large differences in nonpayment rates do not influence the forbearance differences. Conditional on being past due on payments, similarly high fractions of minority and white borrowers were enrolled in forbearance plans. For example, as of August 2020 84 percent of all white borrowers who were 30-plus DPD were enrolled in forbearance, compared with 88 percent of Asian borrowers, 83 percent of Black borrowers, and 87 percent of Hispanic borrowers. We also see similar forbearance enrollment rates across the income distribution: borrowers with low or moderate incomes were only slightly less likely to enroll in forbearance compared to higher-income borrowers. Finally, Figure 5.7b shows that conditional forbearance rates are nearly identical across counties with top quartile versus bottom quartile increases in unemployment rates. Thus, while minority and low-income borrowers were much more likely to miss payments during the pandemic relative to white and high-income borrowers, those who missed payments were approximately equally as likely to take advantage of payment relief offered through forbearance.

FIGURE 5.6

Households Past Due on Mortgage Payments and in Forbearance, by Income



Source: CFPB n.d.; Equifax n.d.; New York Federal Reserve Bank n.d.; authors' calculations.

Note: Borrowers are classified as low- or moderate-income (LMI) if their real income at origination (measured in 2021 dollars) is less than 80 percent of the 2021 median family income in their metro area (or state, for borrowers outside metro areas).

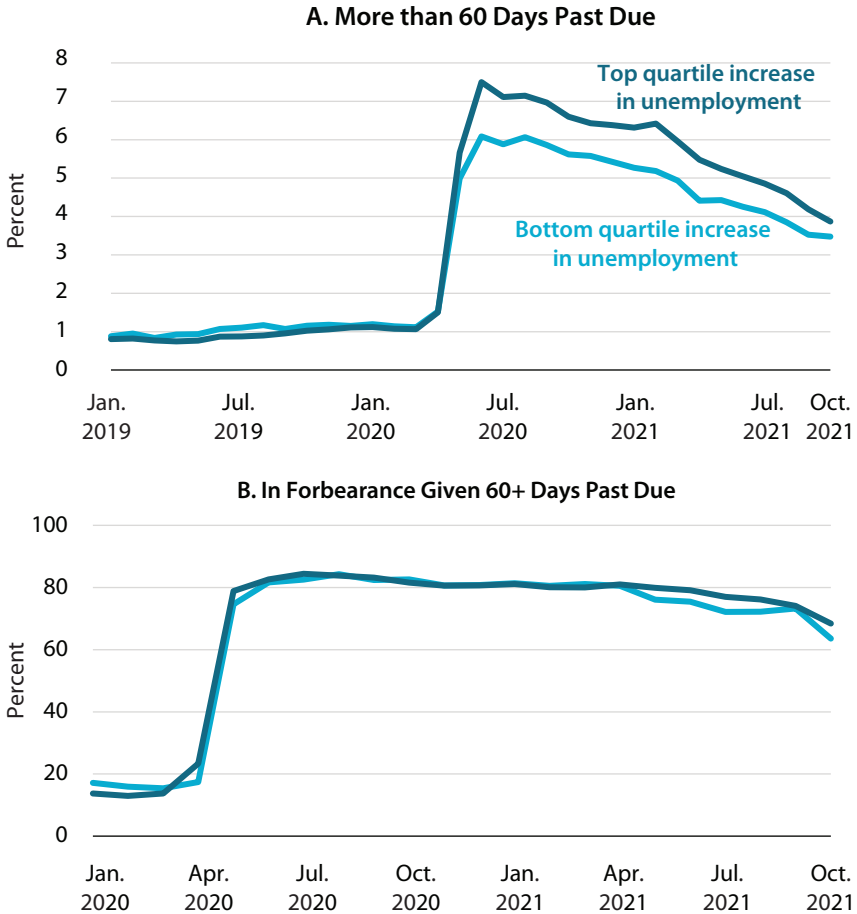
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FIGURE 5.7

Households Past Due on Mortgage Payments and in Forbearance, by Unemployment



Source: CFPB n.d.; Equifax n.d.; New York Federal Reserve Bank n.d.; authors' calculations.

Note: Borrowers are classified as top-quartile if their county's unemployment rate increased by more than the 75th percentile of counties nationwide (10.6 percentage points) between February and April 2020. Bottom-quartile borrowers resided in counties with unemployment rates that increased by less than 4.9 percentage points during this period. Nonpayment indicators are derived using McDash data; forbearance is derived from Equifax data.

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Refinancing

Using pre-pandemic data, Gerardi, Willen, and Zhang (2020) showed that racial disparities in refinance behavior are significantly exacerbated during periods of low interest rates and high refinance volume. Since the pandemic was characterized by both historically low mortgage rates and significant refinance activity, we might expect to find similarly large disparities during this period.

Figure 5.8a shows the evolution of refinance propensities during the pandemic by plotting monthly, unconditional refinance rates for our different racial and ethnic groups. Refinance rates were similar across all groups in the first few months of 2020, before the onset of the pandemic. Beginning in March 2020, however, a significant gap between white or Asian borrowers and Black or Hispanic borrowers emerged. Asian borrowers had the highest refinance propensities during the pandemic, while Black borrowers were the least likely to refinance. Notably, the racial gaps in refinance activity persisted through the entire pandemic. Figure 5.8b displays refinance rates for loans taken out by single male borrowers, single female borrowers, and multiple borrowers. Figure 5.8c shows refinance propensities for low- and moderate-income borrowers and above moderate income borrowers. Finally, Figure 5.8d shows refinance hazards for loans originated in counties with top and bottom quartile increases in the unemployment rate during the pandemic.

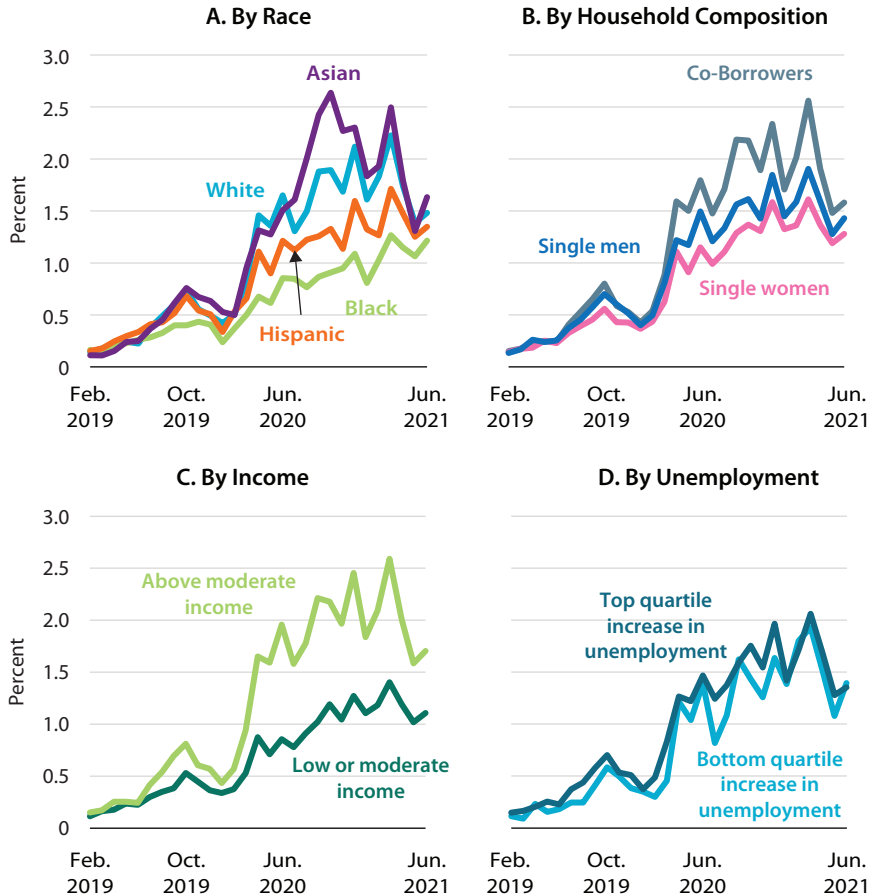
Refinance rates were significantly higher for loans with multiple borrowers during the pandemic period compared to loans with only a single borrower. Among single-borrowers, males were slightly more likely to refinance than females. While the difference in refinance rates between higher-income and low-to-moderate income borrowers was small in the pre-pandemic period, higher-income borrowers were approximately twice as likely to refinance during the pandemic. Agarwal et al. 2021 also find significantly lower refinancing activity among low-income borrowers. Differences in refinance propensities between loans in high-unemployment and low-unemployment growth counties were small.

While Figure 5.8 shows unconditional refinance rates, the size of the disparities is not materially affected if refinance rates are conditioned on observable borrower and loan characteristics like credit scores, whether the borrower has been current on mortgage payments, loan-to-value ratios, the incentive to refinance (how much the borrower's rate differs from what is available in the market), and geographic location.¹³ That is, the difference in refinance rates by group is not explained by differences in loan or borrower characteristics included in our data. An important factor that we cannot observe is how a

13. For more details about how controlling for observables impacts refinance disparities, see Gerardi, Lambie-Hanson, and Willen (2021). This is contrary to the findings of Gerardi, Willen, and Zhang (2020), who show that approximately 80 percent of the unconditional refinance gap between Black and white borrowers can be accounted for by differences in observable characteristics.

FIGURE 5.8

Share of Borrowers Who Refinanced Their Mortgage, February 2019–June 2021



Source: CFPB n.d.; Equifax n.d.; BLS 2022; authors' calculations.

Note: Panels A and B: Borrower race and ethnicity (Panel A) and borrower gender (Panel B) are captured in CFPB (n.d.). Panel C: Borrowers are classified as low- or moderate-income (LMI) if their real income at origination (measured in 2021 dollars) is less than the 2021 median family income in their metro area (or state, for borrowers outside metro areas). Panel D: Borrowers are classified as top-quartile if their county's unemployment rate increased by more than the 75th percentile of counties nationwide (10.6 percentage points) between February and April 2020. Bottom-quartile borrowers resided in counties with unemployment rates that increased by less than 4.9 percentage points during this period.

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borrower's income and employment status change over time. Black and Hispanic households lost their jobs at higher rates during the pandemic, which likely contributed to the disparities in their ability to refinance.

The racial disparities in refinance activity documented in Figure 5.8 are significant and lead to large differences in how the total benefits from the lower interest rate environment are shared. Those total gains are a function of the probability that a borrower refinances and how much borrowers who do refinance save. Gerardi, Lambie-Hanson, and Willen (2021) find that the mean monthly payment reductions for borrowers who refinanced were generally similar across groups. White borrowers generally had lower existing interest rates, which lowered their gain from refinancing, but they also had bigger mortgages, which worked in the opposite direction. Annualizing the savings and multiplying them by estimates of the number of mortgages held by each racial and ethnic group, we estimate that American homeowners who refinanced through October 2020 will save about \$5 billion a year until they refinance again or sell their homes. We estimate that Black homeowners account for only \$198 million, or 3.7 percent, of the savings despite holding roughly 5.9 percent of balances in our mortgage sample. In contrast, white borrowers account for approximately 71.1 percent of the savings (\$3.8 billion), which is a slightly larger percentage of their sample share (69 percent).

Lessons Learned

Mortgage borrowers, like all Americans, experienced significant turmoil during the COVID-19 pandemic. According to the MBA, in the second quarter of 2020, the percentage of mortgage borrowers who were past due peaked at 6.7 percent. That rate fell to 3.5 percent of mortgage borrowers in the fourth quarter of 2021, almost a 50 percent reduction in six quarters. To put that in perspective, after the GFC, the rate peaked at 10.2 percent in the first quarter of 2010 and took until the third quarter of 2014 for the past due rate to fall by 50 percent, roughly three times as long. What role did policy play in those outcomes? What went right and what went wrong? How important was it that the nature of the downturns was so different? Does success in this episode provide us with a road map or even useful insights for the future? Can we say that the policies targeting homeowners had been a success? We now review the three policy levers, forbearance, interest rate reductions and income support, in turn.

Forbearance was especially effective due to its timeliness and the ease with which borrowers were able to take advantage of it. Unlike the Home Affordable Modification Program (HAMP), the primary mortgage market policy enacted in the aftermath of the GFC, enrolling in forbearance required zero documentation on the part of borrowers and only minimal contact with mortgage servicers. Borrowers simply had to contact their servicer and attest to experiencing financial hardship due to the pandemic. Thus, whereas the

HAMP program took about a year to really get up and running at full capacity, forbearance was heavily utilized almost instantaneously.

Furthermore, forbearance, unlike modifications and principal reduction, is incentive compatible, meaning it is most attractive to those who really need it: financially distressed borrowers. The reason is that forbearance requires borrowers to pay back their missed payments and thus, does not significantly lower the net present value (NPV) of payment obligations. The emerging empirical evidence on forbearance usage suggests that it was, in fact, used by the borrowers who needed it the most, with little evidence that it was used strategically by non-distressed borrowers. Using a survey of over 1,000 homeowners, Lambie-Hanson, Vickery, and Akana (2021) find that borrowers who used forbearance overwhelmingly had personally suffered a job loss or income disruption during the pandemic. They also show that forbearance was concentrated among borrowers who were employed pre-pandemic in industries hard hit by COVID-19, including leisure, hospitality, arts, and entertainment. An additional piece of evidence that forbearance targeted borrowers in need is that as financial distress waned over the course of the pandemic, so did forbearance usage. Forbearance was used most intensively in the second quarter of 2020 when labor income losses were most significant.

Incentive compatibility meant that forbearance contrasts favorably with the concessionary loan modifications used to assist borrowers during the GFC. The most common loan modifications reduced interest rates, thereby significantly lowering the NPV of payment obligations, making them appealing to both distressed borrowers as well as non-distressed borrowers. Studies such as Mayer, Morrison, Piskorski, and Gupta (2014) have documented evidence that this moral hazard was a nontrivial issue for some of the modification programs rolled out in the aftermath of the GFC. To avoid modifying loans for borrowers not in need, lenders demanded extensive documentation of hardship and, even then, foreclosed on many borrowers even when it was more costly to foreclose than to modify.¹⁴ In addition, the complexity of dealing with these information problems meant that the flagship Federal Home Affordable Mortgage Program (HAMP) did not really start to make a difference until several years after policymakers identified a foreclosure problem in the United States. As our data shows, forbearance was helping borrowers at the beginning of April, days after Congress passed the CARES Act and before even expanded unemployment insurance which did not start to flow in earnest until May.

Supporting these distressed borrowers also had spillover effects on their communities. Normally, increases in area unemployment and corresponding negative income shocks would lead to more houses being put up for sale, which pushes down prices. But Anenberg and Scharlemann (2021) show that

14. See Adelino, Gerardi, and Willen (2013) for a discussion of why information asymmetries lead rational lenders to foreclose rather than modify loans even when the loss from foreclosure exceeds the reduced NPV from modification.

forbearance offset pandemic-related increases in unemployment, decreasing the number of new for-sale listings and propping up county-level home prices.

As a result, one might conclude that policymakers should have turned to forbearance in 2008 and should do so in any future economic downturn. However, there are three important points that should be considered before settling on such a conclusion. First, forbearance is not costless. Put simply, lenders are effectively extending interest free loans to borrowers which is costly even in a low interest rate environment.

Second, although the government insures investors against any missed payments of interest and principal on MBS, there is a lag between missed payments by borrowers and insurance payments by the government. Loan servicers are contractually obligated to cover this gap and can find themselves in a liquidity squeeze.¹⁵ Indeed, a sufficiently high rate of forbearance could bankrupt mortgage servicers.¹⁶ To address this risk, federal agencies changed their reimbursement policies in March and April of 2020. Fannie Mae lowered the number of months that servicers were responsible for covering missed payments from twelve to four. Ginnie Mae set up the Pass-Through Assistance Program (PTAP), an emergency credit facility that servicers could access to fund payments. In the end, lower-than-expected forbearance take-up and an increase in highly profitable refinance activity meant that servicers had ample liquidity throughout the pandemic. However, if a broad-based forbearance policy is considered in response to a future crisis, servicer liquidity risk could resurface as a first-order concern.

The third point to keep in mind before concluding that forbearance is a panacea is that there were features of the pandemic that likely made a policy of broad-based forbearance particularly advantageous. First, the extremely rapid jobs recovery in the late spring and summer of 2020 meant that many distressed borrowers who had lost their jobs only needed a few months of assistance. Most recessions, especially the Great Recession, are characterized by much longer labor market recoveries. Second, most mortgages were federally insured so risks to private investors were minimal. At the start of the pandemic, 62 percent of mortgages by value were held in Fannie Mae, Freddie Mac, or Ginnie Mae mortgage-backed securities, meaning that the U.S. Treasury effectively guaranteed repayment of principal and interest. By contrast, before the GFC, the comparable figure was 43 percent.

15. Before the pandemic period, Fannie Mae required servicers to forward principal and interest payments for 12 months for loans in forbearance, while Freddie Mac required 4 months of advances before reimbursement could occur. For Ginnie Mae loans, servicers were expected to forward mortgage-related payments for the entire life of the loan.

16. This was especially true for the non-bank mortgage companies (NBMC), which are primarily funded by short-term wholesale debt, exposing them to greater liquidity and running higher risk than banks. NBMCs accounted for the majority of loan originations (approximately 70 percent) in the pre-pandemic period.

Finally, perhaps the most important reason forbearance was so successful was the strong pre-pandemic housing market, and specifically the robust house price growth that most areas of the country experienced in the years before and, more importantly, during the pandemic. Among borrowers in our sample whose loans were still active in February 2020, the median house price appreciation in their area over the next year was 9.8 percent, and the average was 10.2 percent. And house price growth was widespread, as even the 10th percentile of the growth distribution in our sample experienced more than 5 percent appreciation during the pandemic. Strong house price growth before and during the pandemic translated into significant amounts of accumulated housing wealth for borrowers. We estimate that the median borrower in our sample had an equity position of more than 45 percent as of February 2021. More importantly, unlike during the GFC and Great Recession, negative equity was not an issue. Even borrowers at the fifth percentile of the equity distribution in our sample had accumulated significant wealth in their homes. This meant that most borrowers were not at risk of foreclosure when exiting forbearance, as they had the option to sell their properties if they were still unable to resume making mortgage payments. In contrast, during the GFC, negative equity was a huge problem, and temporary payment forgiveness was not as effective in preventing large numbers of defaults and foreclosures. As documented in Adelino, Gerardi, and Willen (2013), most loan modifications granted by servicers in the lead-up to the GFC mirrored forbearance in that they did not change any of the loan terms but simply involved the capitalization of arrears into the balance of the loan. Before the GFC, these modifications were often successful in giving borrowers time to cure their delinquencies, but in the aftermath of the GFC, non-concessionary modifications proved to be ineffective as household distress due to employment and income loss became more prevalent and persistent.

Despite these caveats, we believe that forbearance could be a useful tool in mitigating mortgage market distress in a future crisis. Many of the factors that made forbearance such an effective policy in the pandemic period are likely to be present in the next crisis. For example, the share of mortgages insured by the government has gone up since 2020, reaching 67 percent in the second quarter of 2021. The severe national house price decline that resulted in widespread negative equity was really a phenomenon unique to the GFC. In most post-war recessions house prices did not significantly decline at the national level, and thus, a future recession accompanied by deep, broad-based negative equity is unlikely.

Turning to the Federal Reserve's monetary policy and large-scale MBS purchases, the resulting reduction in mortgage rates and boom in refinances did serve to reduce household financial distress. However, as a method for offsetting the shock of the pandemic, its effectiveness was limited. Low mortgage rates were slow to diffuse through the economy, and intermediaries captured a significant portion of the benefits, at least initially (Fuster et al. 2021). Figure 5.4

shows that the benefits of lower rates went into effect gradually over six quarters. There are several reasons for this lag. The first reason, as discussed above, is that lenders have limited capacity for processing refinances, a problem aggravated by the pandemic. Lenders rationed by raising prices, as Figure 5.4b shows. Another is that refinances take 45 days or more even in normal times, and higher volumes, combined with pandemic-related constraints on production, stretched timelines out even more. Finally, another reason for the slow take-up of low rates is borrower inattention, as documented by Andersen et al. (2020).

As mentioned above, enrollment in a forbearance plan disqualified a borrower from refinancing into a new loan, and most lenders required a borrower who had exited forbearance to make three consecutive payments before approving a refinance. The refinancing process is also quite costly, with high fees and taxes, which limits take-up. In addition, as we showed in section 4, Black and Hispanic borrowers were significantly less likely to benefit from low interest rates.

There are a few possible ways to ensure that lower mortgage rates reach more borrowers and do so more quickly. One possibility is to increase the prevalence of streamlined refinance programs. Gerardi, Loewenstein, and Willen (2021) argued that a streamlined refinance program that did not require documentation of employment or income during the early stages of the pandemic would have provided necessary payment relief to many borrowers who had experienced financial hardship. Another possibility would be to expand the use of adjustable-rate mortgages or other types of mortgage products that automatically pass interest rate declines through to borrowers. Borrowers with adjustable-rate mortgages, more prevalent outside the United States, would have seen more-or-less immediate payment relief in April 2020 rather than having to initiate a costly and time-consuming refinance. One promising product in our view is the ratchet mortgage, which combines the benefits of both fixed-rate loans and adjustable-rate mortgages. The ratchet mortgage allows downward adjustments in the mortgage rate but does not allow increases. This type of product provides lower costs to borrowers over the life of the loan and eliminates the subsidization of those who refinance more frequently by those who refinance less frequently, in exchange for a potentially higher initial rate.

Finally, the income support programs during the pandemic clearly played a large role in alleviating financial distress, especially the expansion in the UI benefits program. As detailed in Chapter 2 of this volume, the UI expansion fully restored income for many unemployed individuals and in some cases more than restored it. Dettling and Lambie-Hanson (2021) construct a measure of income support (e.g., UI, stimulus checks, and Paycheck Protection Program loans) relative to pre-pandemic incomes in each state and county. They document significant variation in the extent to which these federal programs provided under the CARES Act replaced lost income, and that geographic areas with more generous income support experienced better mortgage outcomes. Controlling for unemployment, the share of mortgages

that are government-backed, COVID-19 cases, and social distancing policies, they find that a one-standard-deviation increase in the index of CARES Act income support generosity is associated with rates of mortgage nonpayment (delinquency and/or forbearance rates) that were about two percentage points lower, or roughly a 25 percent reduction.

While income support programs are broad based and can help to alleviate distress in both the rental and mortgage markets, they do have a few drawbacks. One issue is cost. They are much more expensive to taxpayers than forbearance or interest rate reductions. In addition, because income support is typically provided as a gift and not a loan, it suffers from moral hazard problems that are much more severe. A person who has lost his job may have less incentive to seek a new job if he is receiving generous unemployment benefits, which are never repaid. However, there is less incentive for a borrower to voluntarily skip mortgage payments through forbearance, since that debt must ultimately be repaid. As a result, it seems that few borrowers misrepresented themselves as negatively affected by COVID-19 in order to get forbearance; in contrast, fraud was a major concern for both the Paycheck Protection Program and expanded UI benefits programs. Finally, although income support programs provide help to households much faster than rate cuts, they are not as timely as forbearance. In some states (e.g., Florida) it took several weeks for UI benefits to reach newly unemployed individuals at the start of the pandemic.¹⁷

17. See Mazzei and Tavernise (2020) for a discussion of this issue.

Part II. Lessons Learned from Rental Policies and Outcomes

Laurie S. Goodman and Susan Wachter

Rent Burden and Related Federal Programs before the Pandemic

Before the pandemic, many households were rent burdened, meaning that they spent more than 30 percent of income on rent. For example, in 2019, 46.3 percent of all renters were rent burdened. Of those renters, approximately half spent over 50 percent of their income on rent (see Table 5.2). After rising almost 6 percentage points in the early 2000s, those shares have remained relatively steady over the past decade.

Low-income households were more likely to be rent burdened before the pandemic. At one end of the range, 81.9 percent of renters with household incomes of less than \$25,000 were housing cost burdened in 2019 (here referred to as rent burdened). At the other end, only 6.8 percent for those with incomes of \$75,000 and over were (Joint Center for Housing Studies 2021, figure 31).

A patchwork of federal programs offers rental assistance to an estimated 4.9 million households (Center on Budget and Policy Priorities 2022a).¹⁸ They include:

- public housing with over 3,000 housing authorities managing approximately 900,000 units;
- the Housing Choice Voucher Program (formerly Section 8 formerly Section 8 vouchers (which subsidizes private market rents for 2.3 million low-income households);
- the Department of Housing and Urban Development’s Section 8 Project-based rental assistance programs in which government authorities contract directly with private or nonprofit organizations to operate specific properties that provide affordable homes to low-income tenants and serve an estimated 1.2 million households;
- the Department of Housing and Urban Development’s Section 202 Housing for the Elderly and Section 811 Housing for People with Disabilities, which provides rental assistance and support services to 154,000 households; and,
- the U.S. Department of Agriculture’s rural rental assistance, which includes both Section 515 Rural Rental Housing and Section 514 Farm Labor Housing properties, which serve 269,000 households.

18. See Center on Budget and Policy Priorities (2022b) for detailed information on the data sources.

TABLE 5.2

Distribution of Cost Burdened Households

All

Cost burdened	46.3 percent
Moderately cost burdened	22.4 percent
Severely cost burdened	23.9 percent

Cost Burdened, by Household Income

Less than \$25,000	81.9 percent
\$25,000–49,999	57.8 percent
\$50,000–74,999	25.7 percent
\$75,000+	6.8 percent

Source: Joint Center for Housing Studies 2021.

Note: Cost burdened is defined as spending 30 percent or more of income on housing. Severely cost burdened is defined as spending 50 percent or more of income on housing.



However, many renters who qualify for federal rental assistance do not receive it because funding for federal rental assistance programs is insufficient to meet need. According to the Center on Budget and Policy Priorities (2022a, 2022b), 23.4 million low-income households were severely rent burdened; that is, they paid more than half their income for housing. However, just one in four households (4.9 million) received federal aid.

Renter Distress before and during the Pandemic

There are limited data on the prevalence of renter distress prior to the pandemic. We do not have a full time series of the number of renters who missed payments or were evicted from their homes per year. Our best data are from a single year: the 2017 American Housing Survey. That survey indicates that 6.8 percent of renters were unable to pay all or part of their rent in the three months before the survey date.

Survey Evidence on Renter Distress during the Pandemic

Measuring how much renter delinquency rose during the pandemic is difficult both because of the absence of a pre-pandemic baseline and because a different question was asked in the two pandemic-era surveys of renters: the Understanding America Survey (UAS)—conducted by the University of Southern California (USC Center for Economic and Social Research n.d.) from April

2020 to June 2021 and the Census Household Pulse Survey (HPS), which began in April 2020 and has continued since. The UAS asks whether households are behind on rent in the current month, and the HPS asks whether a respondent is fully caught up on rent (e.g., respondents saying they are behind on rent in September 2020 could have missed a payment six months earlier). These differences in the questions make detecting small increases in rental distress due to the pandemic difficult to measure. Moreover, it is unclear whether the HPS is representative given its experimental nature, mode of collection, and very low response rates.

With those significant caveats in mind, the HPS indicates that the share of renter households who reported being behind on their rent peaked at 21 percent in January 2021. From March 2021 through February 2022, the numbers fluctuated between 14 to 17 percent; the latest available number for the two weeks ending February 7, 2022, as the Omicron variant of COVID-19 was raging, is at the upper end of that range.¹⁹ Those numbers are higher than those in the UAS, which shows a peak of 14 percent in August 2020 and that as of June 30, 2021, 10 percent of respondents had missed the last month's rent or paid less than the full amount. It is not surprising that the UAS share is somewhat lower since a tenant could be behind on rent but still be able to make the more recent payment.²⁰

Given that an estimated 42 million households were renters making cash payments (as opposed to, say, paying for rent by providing services), an estimated 6.9 million households were behind on their rent in August 2021.²¹ Parrott and Zandi (2021) estimate that households behind on rent collectively owed about \$21 billion as of August 2021, with the average delinquent renter being just over two months behind and owing \$1,477 (\$1,129 in back rent, \$296 in utilities, and \$50 in late fees). That amount is approximately double the back rent owed before the pandemic.

The HPS data show that those behind on rent are disproportionately minorities, with 11.3 percent of white renters behind on rent in February 2022, 19.7 percent of Hispanic renters, and 27.9 percent of Black renters (Figure 5.9). Those behind are disproportionately lower income, with 22.3 percent of those earning

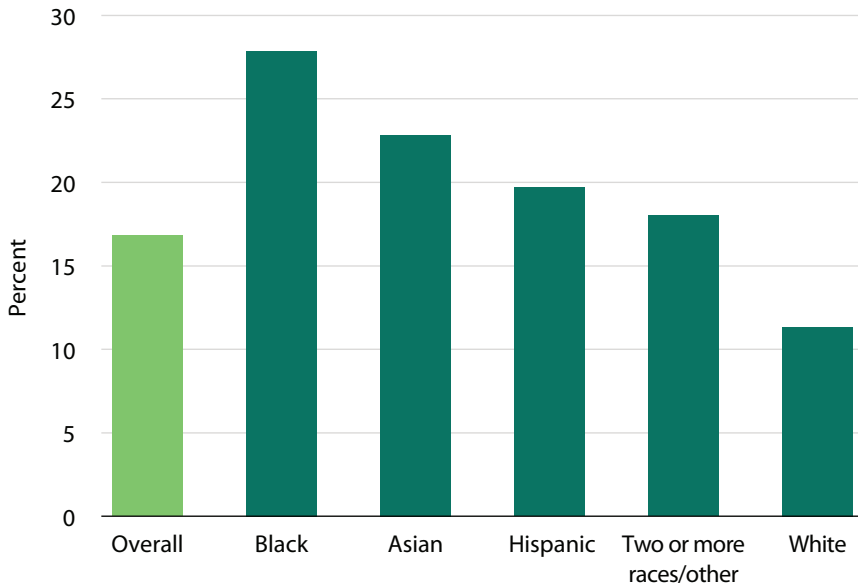
19. The 16.4 percent nonpayment were derived from renters who answered the question, "Are you caught up on rent?" The numerator was the number of renters behind on rent, and the denominator was the total number of renters who paid rent. Those who paid noncash rent (if, for example, the unit is owned by a friend or relative, the renter preforms chores in exchange for rent) were excluded from both the numerator and denominator since these renters are neither current nor delinquent.

20. For more discussion, see Choi, Goodman, and Pang (2022).

21. The 2019 American Community Survey reports indicates there were 44 million renter households, of whom 42 million paid cash rent. In contrast, the HPS surveys individuals, not family units. The Census HPS for the weeks covering August 2021 (week 37, September 1 to September 13, 2021) indicates that just over 16 percent of renters were behind on their rent (U.S. Census Bureau 2021).

FIGURE 5.9

Share of Households Not Caught Up on Rent Payments in 2022, by Race/Ethnicity



Source: U.S. Census Bureau 2021; authors' calculations.

Note: This figure shows the results for responses collected between January 26th and February 7th, 2022. Results include estimates for renters who responded “No” to the following question: “Is this household currently caught up on rent payments?” All racial groups are non-Hispanic.

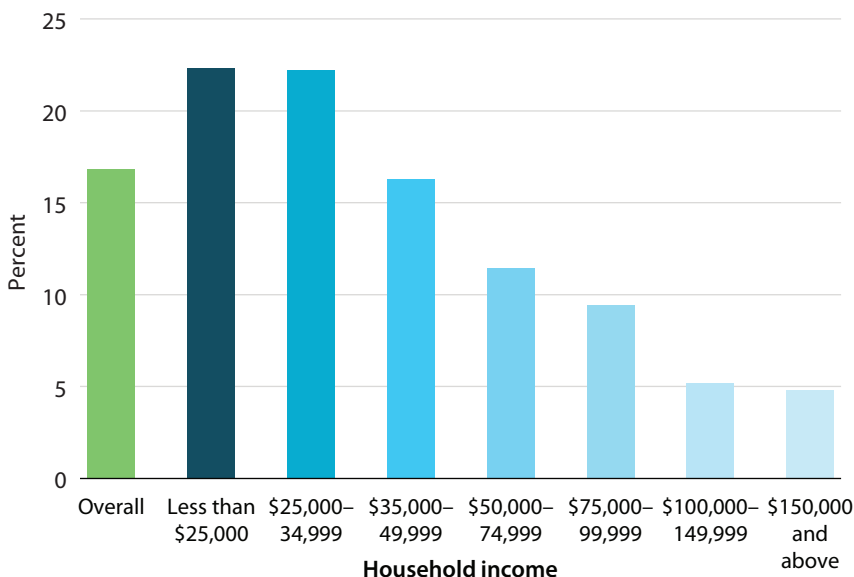


less than \$25,000 behind on rent versus 11.1 percent earning \$50,000–\$75,000 and 5.1 percent of those earning \$100,000–\$150,000 (Figure 5.10). Renters with children under 18 are more apt to be behind on rent, 23.1 percent versus 12.9 percent for those without children.

We can compare the pandemic survey data to the 2017 American Housing Survey to get a sense of how much rental distress has increased during the pandemic. However, the differences in questions asked by the surveys suggest that comparing it to the HPS likely leads to too large of an increase, while comparing it to the UAS likely leads to too small of an increase. With that in mind, the comparison to the HPS shows that the rate of renter distress rose by 13.9 percentage points from 2017 to its peak in January 2021. By February 2022, the rate was 10 percentage points higher than 2017 levels. The comparison to the UAS shows a peak increase of 7.1 percentage points in August 2020 and a three-percentage-point increase in June 2021.

FIGURE 5.10

Share of Households Not Caught Up on Rent Payments in 2022, by Income



Source: U.S. Census Bureau 2021; authors' calculations.

Note: This figure shows the results for responses collected between January 26th and February 7th, 2022. Results include estimates for renters who responded "No" to the following question: "Is this household currently caught up on rent payments?"



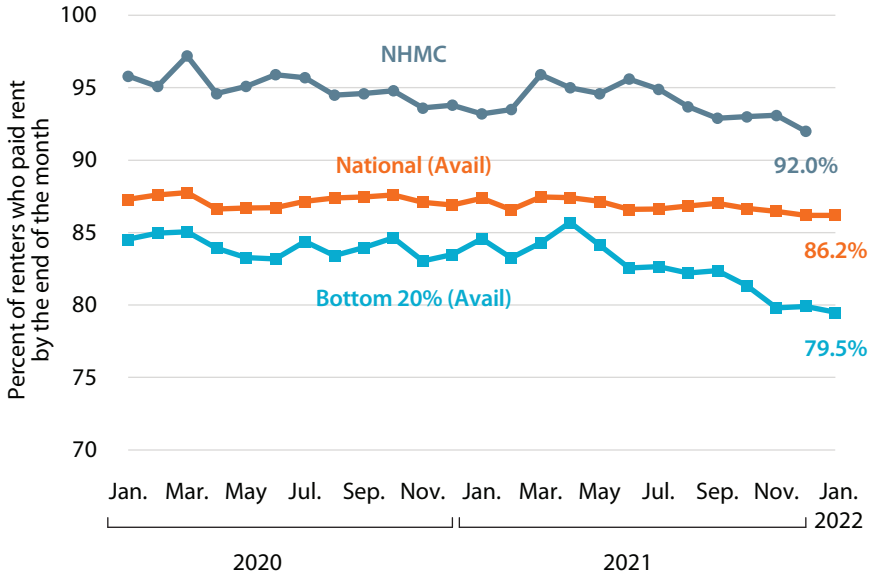
Administrative Data for Subsets of Renters

Two sources of administrative data allow us to look at pre-COVID versus post-COVID rent collections for subsets of the renter population. The first is from the National Multifamily Housing Council (NMHC), which predominantly reflects renters in buildings with 50 or more units. The second is from Avail, a vendor for mom-and-pop investors, who predominantly own single-family structures. Both datasets report the share of renter households who have paid for their rent by the last day of the month. The NMHC sample is skewed toward more affluent renters and newer, more upscale buildings. It is unclear if the Avail data are skewed by income.²²

22. The Avail data, developed in collaboration with the Urban Institute, include renters of single-family houses, who tend to be more affluent than renters in buildings with more units, but they also include renters of properties in buildings with two to four units, who have the lowest income of all structure types according to the 2018 American Community Survey.

FIGURE 5.11

Share of Renters Who Paid Rent by the End of the Month, January 2020–January 2022



Source: Avail 2022; National Multifamily Housing Council (NMHC) 2021.

Note: Rent payment data includes both full and partial payments. The share of those who made partial payments account for only 1 to 2 percent of those who made payments throughout the sample period. NMHC data collected ended December 31, 2021. Avail data has been updated through January 2022.



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Across both datasets, the share of renter households who missed a rental payment between the January 2020 and January 2022 increased by 1 to 3 percentage points (Figure 5.11). The Avail data suggest that the increase in the share was larger for lower-income households. Among those with the lowest 20 percent of rent costs, which likely reflects more lower-income households, the increase in the share missing their last rental payment was roughly 5 percentage points.

Of course, these findings about changes in renter distress during the pandemic measure changes for broad groups of renters. Rates of distress likely rose much more steeply among households who saw declines in income but did not receive substantial fiscal aid.

Policy Interventions

In this section, we focus on the three major economic policy responses enacted during the COVID-19 pandemic that benefited renters (for a discussion of housing as an automatic stabilizer, see Collinson, Ellen, and Keys 2021). We look at cash payments, including enhanced Unemployment Insurance (UI) and the three Economic Impact Payments (EIP); the eviction moratorium; and the Emergency Rental Assistance (ERA) program.

Cash Payments: Enhanced UI and EIPs

As discussed in Chapters 2 and 3 of this volume, Congress provided substantial income support to households during the pandemic. New provisions greatly expanded the scope of those eligible for UI, lengthened the period during which one could receive benefits, and provided extra weekly payments of \$600 a week and later \$300 a week. The additional payments substantially reduced the loss of income for many unemployed workers. Indeed, many earned more from UI than they had lost in wages, particularly low-wage workers since the extra benefit was a flat amount unrelated to previous earnings (Kovalsky and Sheiner 2020).

In the spring of 2020 most taxpayers received EIP checks that totaled \$3,400 for a family of four (\$1,200 per adult and \$500 per child).²³ Two additional rounds of relief—in January and March/April 2021—together provided \$2,000 per person or \$8,000 for a family of four. Thus, most families of four received a total of \$11,400 in EIPs between April 2020 and April 2021.

Administrative problems initially delayed UI benefits for many, and some of the unemployed could not easily navigate the intake process. However, it is likely that the EIPs were able to tide many renters over until unemployment benefits could be accessed. Nevertheless, the programs did leave some people behind: most of those who experienced a cut in hours or wages probably did not receive UI benefits. Moreover, undocumented workers or those not explicitly authorized to work in the U.S. do not qualify for unemployment benefits, and these workers were usually ineligible for EIPs.²⁴

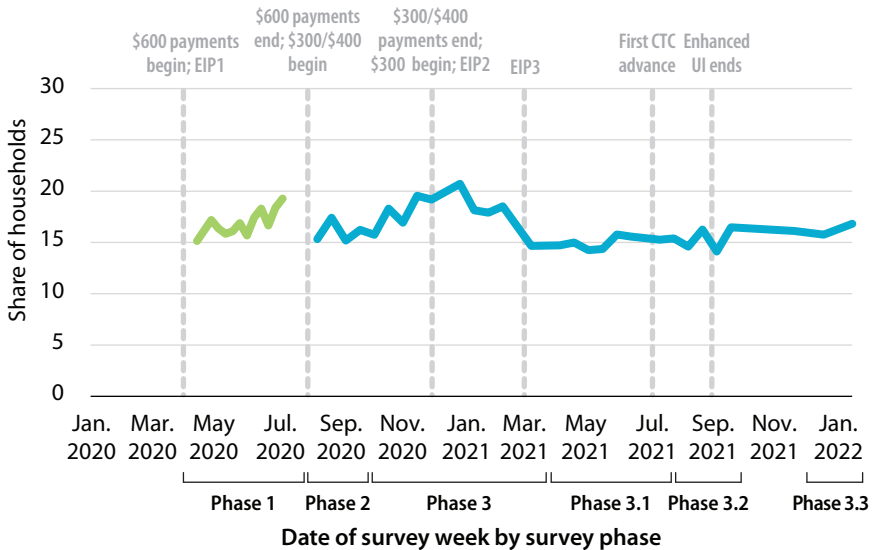
Despite these constraints, the cash benefits—enhanced UI and EIPs—substantially cushioned the impact of a loss of employment for renters (Figure 5.12). As a result, we see little evidence that the increase in renter distress was pronounced among those who lost their jobs during the pandemic. For example, there is no correlation between the timing patterns of the increase

23. See Chapter 3 in this volume for a description of the eligibility requirements for these payments.

24. Only people with valid Social Security numbers are eligible for stimulus payments. Undocumented workers and people who file taxes with an individual taxpayer identification number (ITIN) are not eligible. In the first two rounds of economic stimulus payments, if one adult in the family filed with an ITIN, the entire family was ineligible. In the third round, this “family penalty” was removed; adults with Social Security numbers in mixed immigration families are eligible for economic stimulus payments as are their dependents.

FIGURE 5.12

Share of Households Behind on Rent Payments, March 2020–February 2022



Source: Census Household Pulse Survey (HPS) n.d.; authors' calculations.

Note: The form of the question changed slightly over time. From August 2020 on, the HPS asked respondents if their households are currently caught up on rent payments. From April–July 2020, HPS asked respondents if they paid their rent the previous month. We examine the overall share of renter occupied households who report being behind on rent payment during the survey week. The green line includes households who reported “payment was deferred.” The most recent collection of HPS data spans January 26th to February 7th, 2022.



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in unemployment and the increase in renter delinquency. The unemployment rate spiked from 3.5 percent in February 2020 to 14.8 percent in April 2020 and then declined to 11.1 percent in June 2020, 6.7 percent in December 2020, and 4.1 percent in November 2021. But the number of renters who could not pay their rent exhibited only a small variation in both the Avail and NHMC data (Figure 5.3). In addition, the share of renters owing back rent in the HPS data has varied from a low of 14 percent to a high of 20.7 percent and exhibited no correlation with unemployment rates. The lack of a relationship between unemployment and delinquencies suggests that the cash benefits prevented the newly unemployed from missing rent payments. Nonetheless, it is difficult to see a relationship between the pattern of weekly benefits to the unemployed and rental delinquencies, shown in Figure 5.12.

TABLE 5.3

Households Who Experienced Income Shock During COVID-19

Household Income	Households with at Least One Job Loss	Share of Households at Income Level with at Least One Job Loss
Below 30% of AMI	1,098,419	10.6%
30–50% of AMI	1,286,004	18.3%
50–80% of AMI	1,963,293	22.4%
80–100% of AMI	1,064,089	24.3%
100–150% of AMI	1,831,024	26.3%
150%+ of AMI	1,671,813	26.8%
Total	8,914,642	20.4%

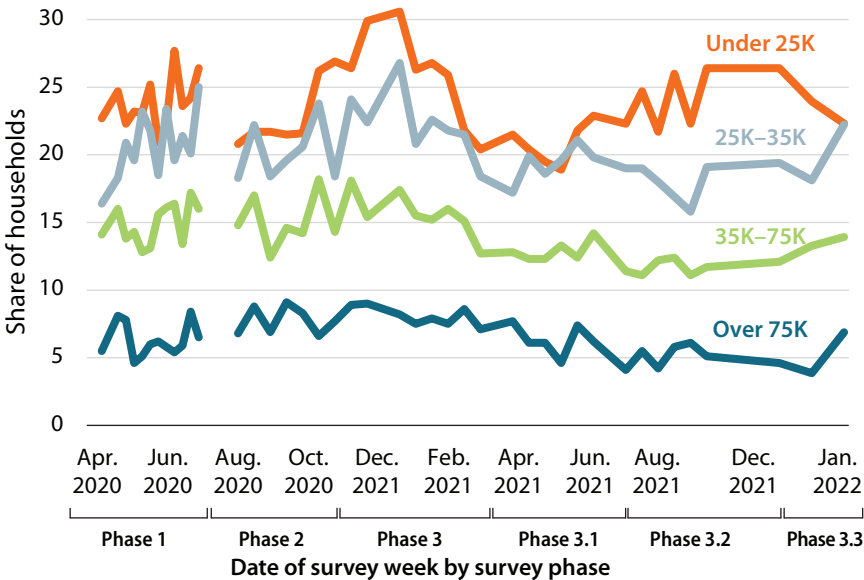
Source: Strochak et al. 2020.



Another piece of evidence that job loss did not drive renter distress is that increases in distress were highest among low-income renters, while job loss was more common for those with higher incomes. Using BLS data on the change in job loss from mid-February to mid-April 2020 by state and industry, Strochak et al. (2020) estimate that approximately 8.9 million renter households—20 percent of all renter households—lost a job over this period. Among these, only 11 percent of households with incomes below 30 percent of Area Median Income (AMI) had at least one job loss versus roughly 25 percent of renters with incomes between 80 and 150 percent of AMI (see Table 5.3 and Strochak et al. 2020). At the same time, the HPS data in Figure 5.13 show that lower-income renters were more apt to be behind on rent. For example, survey data from May 7 to May 12, 2020, show that 22.7 percent of renters with incomes under \$25,000 were behind on their rent versus 16 percent of renters with incomes \$35,000–\$75,000 and 8.1 percent of renters with incomes over \$75,000.

The evidence suggests that expanded UI benefits worked to alleviate renter distress among those who lost their jobs and therefore points to other factors behind the increase in renter distress besides the weakness in the labor market. One reason that the weakness in the labor market probably had muted effects is that before the pandemic, low-income renters were less likely to work for pay. Using the 2018 American Community Survey, Strochak et al. (2020) argue that only 43 percent of renters earning below 30 percent AMI worked in the previous year, compared to over 80 percent of renters earning over 80 percent of AMI. Relatedly, for those with very low incomes, the share of renters behind on their rent remained relatively elevated over the course of the pandemic even as the labor market improved. In contrast, the share among higher-income renters improved over time.

FIGURE 5.13
Share of Households Behind on Rent Payments,
by Income Group



Source: U.S. Census Bureau 2021; authors' calculations.

Note: The form of the question changed slightly over time. From August 2020 on, HPS asked respondents if their households are currently caught up on rent payments. From April–July 2020, HPS asked respondents if they paid their rent the previous month. We examine the overall share of renter occupied households who report being behind on rent payment by income during the survey week. Households who did not report income are dropped from the sample. For the period April–June 2020, deferred is included in the current category. The most recent collection of HPS data spans January 26th to February 7th, 2022.



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Given this, and the fact that low-income renters were more likely to be rent burdened and behind on rent before the pandemic, it is reasonable to conclude the increase in renter distress was highest among groups struggling prior to the pandemic. Pinpointing the increased source of financial strain for those households is difficult. It is possible that those households were ineligible or could not access cash assistance to make up for a loss of income, a loss of financial assistance from friends and family, or increase in expenses. For example, it is possible that this group was more likely to lose hours at work and did not receive UI (although some were likely eligible).

Eviction Moratorium

The federal eviction moratorium boosted housing security for renters behind on their rent and unable to access sufficient fiscal support. The moratorium was put into place by the March 2020 CARES Act, providing a 120-day moratorium through July 24, 2020, for renters in Federal Housing Assistance programs or who lived in a property with a federally backed mortgage. This initial moratorium covered less than half of all renters. In addition, many state governments enacted eviction moratoriums during the pandemic that applied to all renters. In April 2020, for example, 15 states had paused eviction for all renters.²⁵ Many localities, some in states with no eviction moratorium, also imposed moratoriums covering all renters.

On September 4, 2020, the Centers for Disease Control and Prevention (CDC) established an eviction moratorium through December 31, 2020. This was extended several times and eventually expired on July 31, 2021 (although it was briefly renewed and again canceled).²⁶ Some state and local moratoriums remained in effect past that date; as of the end of February 2022, there were no statewide moratoriums and only California had some local moratoriums.²⁷ When the federal eviction moratorium expired, the HPS showed an increase in the number of tenants who expected to be evicted in the next two months, but this increase was limited, likely reflecting the fact that labor market conditions were greatly improved by summer 2021.

The federal eviction moratorium was not without conditions. To be eligible for it, the tenant had to fill out a declaration stating that (1) their income was less than \$99,000 (\$198,000 on a joint return) or they had received an EIP; (2) they had used “best efforts” to get all available government assistance for rent or housing; (3) they were unable to pay full rent or make a full housing payment because of lost income due to loss of hours or employment or because of out-of-pocket medical expenses; (4) they had made partial payments when possible;

25. These states were Connecticut, Delaware, Indiana, Kentucky, Maryland, Massachusetts, Minnesota, New York, New Jersey, North Carolina, Pennsylvania, South Carolina, Texas, Virginia, and Washington.

26. When the CDC eviction moratorium expired on July 31, 2021, it could not be extended due to a judicial decision. President Biden put into place a revised moratorium, extending through October 3, 2021, covering COVID-19 “hot spots,” counties experiencing substantial or high levels of transmission. This covered an estimated 99.2 percent of rental households; the moratorium was rejected by the Supreme Court on August 26, 2021.

27. As of December 2021, New York, New Jersey, and New Mexico had statewide eviction moratoriums; Washington, D.C., Massachusetts, Minnesota, Nevada, and Oregon did not allow for eviction if the tenant had applied for Emergency Rental assistance; and California, Georgia, Massachusetts, New York, Oregon, Texas, and Washington had local moratoriums. As of the end of February 2022, no states have statewide eviction moratoriums; Washington, D.C., Massachusetts, Minnesota, New York, Nevada, and Oregon did not allow for eviction if the tenant had applied for ERA; and only California had local moratoriums (Mortgage Bankers Association n.d.).

and (5) they would likely be homeless, need to move into a homeless shelter, or share a new residence in close quarters with multiple people if evicted. Landlords were permitted to challenge the truthfulness of a tenant's declaration, were under no obligation to make tenants aware of the moratorium, and could legally evict a tenant under certain conditions.²⁸

An eviction moratorium imposes costs on landlords who have little recourse to collect overdue rent. The costs can be particularly difficult on mom-and-pop landlords with fewer financial resources. When tenants are not paying, small landlords tend to defer maintenance and may feel pressure to sell the properties.²⁹ In addition, it appears that landlords have tightened screening criteria for potential renters. For example, an Avail survey showed that more landlords are now looking at renters' eviction histories, particularly Black and Hispanic landlords (Choi and Goodman 2020).

There are no data to compare evictions filings nationwide in the recent period versus the pre-pandemic period, so it is difficult to pinpoint the effects of the moratorium on evictions nationally.³⁰ In jurisdictions for which the Eviction Lab collects data, the number of evictions was down substantially during the period the moratorium was in place between September 4, 2020, and July 31, 2021; the number of eviction filings was 47.2 percent of a typical year's level.³¹ However, there was a wide variation, from declines of 10.7 percent in Austin, Texas, to 91.4 percent in Las Vegas, Nevada (Rangel et al. 2021).

Not surprisingly, the two cities with the largest decline in evictions were those with their own eviction moratoriums. Many areas with local eviction moratoriums had fewer conditions under which a tenant could be evicted, and courts were often more stringent in their interpretation of nuisance violations. It is important to realize that these data cover evictions; landlords have other ways to induce tenants to leave, including not renewing leases and cash for keys agreements. It is not clear if these methods were used more during the period the eviction moratorium was in place.

28. These include engaging in criminal activity on the property; threatening the health or safety of other residents; damaging or posing an immediate and significant risk of damage to the property; violating applicable building codes, health ordinances, or other regulations related to health and safety; and violating any contractual obligation other than the timely payment of rent, late fees, penalties, or interest. The last can include nuisance violations such as noise and are highly judgmental.

29. Choi and Goodman (2020) discusses pressure to sell properties; Goodman, Choi, and Pang (2021) discusses deferring maintenance.

30. The 2017 American Housing Survey includes data on evictions and shows that 29 percent of delinquent renters or about 806,000 households had received an eviction notice in the last three months. However, we do not have comparable recent nationwide data.

31. These data are based on the Eviction Lab's Eviction Tracking System (Eviction Lab 2022). This series begins in March of 2020 and covers six states (Connecticut, Delaware, Indiana, Minnesota, Missouri, and New Mexico) as well as 31 municipalities.

These Eviction Lab results were corroborated by a more formal study by An, Gabriel, and Tzur-Han (2021). Using data from the 27 cities covered by the Eviction Lab with complete data, they take advantage of the fact that some states and municipalities imposed eviction moratoriums before the CDC moratorium on September 1, 2020, while others did not. They find that statewide eviction moratoriums reduced the number of evictions by just over 50 percent.

Reducing evictions has important benefits, particularly during a pandemic. Jowers et al. (2021) find that policies that limited evictions reduced COVID-19 infections by 3.8 percent and reduced deaths by 11 percent. Moreover, they estimate that had eviction moratoriums been more comprehensive, COVID-19 infections and deaths would have been significantly lower. Beyond the health benefits, evidence from An, Gabriel and Tzur-Han (2021) suggests that the eviction moratorium provided a valuable safety net to renters and was particularly valuable to those who were troubled before the pandemic. They find that in addition to reducing evictions, moratoriums also resulted in a redirection of scarce household resources to immediate consumption, notably food and grocery spending. This, in turn, reduced food insecurity, with larger effects evidenced among Black households. In addition, they find that the moratoriums reduced reliance on food banks, a finding corroborated with Google Search data. The eviction moratorium also reduced incidences of mental stress.

The moratorium also likely prevented homelessness and other negative outcomes. Collison et al. (2021), based on pre-pandemic data, report that eviction is preceded by markings of economic distress—falling earnings, unemployment, and unpaid bills. However, receiving an eviction order further reduces earnings, credit access, and durable goods consumption and directly increases housing instability, for example, through greater homeless shelter use and more interactions with homeless services. The effects are more pronounced for female and Black tenants.

While the eviction moratorium did put a substantial dent in the number of filings where these data can be tracked, and did contribute to renter well-being, an eviction moratorium alone is not a long-run solution. The tenant still owes the money and may not have the resources to pay. In most areas where the eviction moratorium has been lifted and data can be tracked, evictions are much lower than pre-pandemic, although they are higher than during the moratorium (Haas 2021). It is important to realize that the decline in evictions during the pandemic are not solely the result of the eviction moratorium. The decline may also reflect the impact of ERA, discussed in the next section, as well as greater access to legal aid and the impact of eviction diversion programs.

Emergency Rental Assistance

In March 2021 Congress authorized \$46.55 billion in ERA: \$25 billion in December 2020 (ERA1) and \$21.55 billion (ERA2). The ERA funds took the

form of grants to states, U.S. territories, local governments, and (in the case of the December ERA) Indian tribes or a Tribally Designated Housing Entity. Grantees set up their own procedures to assist households through existing or newly created rental assistance programs. The funds could cover utilities and rent up to 18 months, including up to three months of future rent.

To be eligible for ERA, all three of the following conditions had to be met. First, one or more individuals within the household qualified for unemployment benefits or experienced a reduction in household income, incurred significant costs, or experienced other financial hardship due directly or indirectly to the COVID-19 outbreak. Second, one or more individuals within the household demonstrated a risk of experiencing homelessness or housing instability. Third, the household's income was at or below 80 percent of area median income. The ERA program did not impose restrictions based on immigration status, although many state and local grantees did (U.S. Department of the Treasury 2021a).

Because ERA funds were not allocated until nine months into the crisis, no adequate rental assistance was available when the pandemic first struck. As a result, many people experienced problems like overcrowding and homelessness that may have increased their exposure to the virus and could have contributed to the higher age-adjusted rates of infection and death among people of color. Also, we know that many people dealing with income losses but managing to pay their rent had to make difficult financial choices that can have long-term negative consequences. We know that withholding rent is typically a last resort; before that happens, people pursue other strategies such as taking on credit card debt, borrowing from friends and families, drawing down savings, and cutting back on other expenses (Airgood-Obrycki 2022), many of which could have harmful effects at the time or in the future.

The ERA money was slow to be distributed. As of June 30, 2021, only \$3 billion or 14 percent of the original \$25 billion in ERA had been distributed to 633,000 households (U.S. Department of the Treasury 2021b). By the end of December 2021, \$16.4 billion of the \$25 billion in ERA1 and \$3.96 billion of the \$21.55 billion in ERA2 had been distributed; this constituted 66.4 percent of ERA1 funding and 44 percent of total funding. Approximately 3.8 million families have been aided by this assistance—3 million families from the ERA1 funds and 790,000 families from the ERA2 funds.³²

The above numbers make it clear that even as delayed as the ERA approval was, the rollout took a good deal longer. Most states and localities that received ERA funds from the Department of the Treasury needed to stand up new programs to house this program, and as a result, many of the programs took months to launch. The grantees needed to develop documentation, put into

32. Authors' calculations from the Treasury's monthly ERA data spreadsheet, containing data through December 2021 and released in February 2022 (U.S. Department of the Treasury 2021c).

place portals to accept applications (some grantees developed this in house, while others purchased and customized the software), and develop procedures to process applications.

Some of the programs initially required onerous documentation as there was some confusion among the grantees on how to interpret some of the early Treasury guidance. The May 7, 2021, Treasury FAQ clarified some of the guidance and strongly encouraged state and local grantees to avoid documentation requirements that were likely to be a barrier to participation for eligible households (U.S. Department of the Treasury 2021a). For example, a grantee could rely on an applicant's self-attestation of income in certain circumstances. ERA2 was intended to eliminate still more obstacles. For example, ERA1 permitted, but did not require, programs to help renters when landlords would not cooperate, and ERA2 required payments to renters when landlords would not cooperate.

Meanwhile, evidence of fraud has been minimal (Beam and Casey 2021). Nonetheless, even today there is a wide variation between these programs in terms of documentation requirements as well as in the amount disbursed. The National Low Income Housing Coalition tracks 512 Treasury ERA programs and reports that 62.3 percent of the programs now allow at least one form of self-attestation, with 51.4 percent of the programs allowing self-attestation for COVID-related hardship, 20.9 percent allowing self-attestation for income, 28.9 percent allowing self-attestation for nontraditional income, 17 percent allowing attestation for housing instability, and 11.9 percent allowing self-attestation for lease/proof of tenancy (National Low Income Housing Coalition 2022). The amount paid out from ERA programs ranges from a low in the single digits to a high of 100 percent.

Because, as discussed above, most of the renters who experienced job loss likely had income above 80 percent of AMI, the ERA was more targeted to renters in distress for reasons other than job loss, and these renters were more likely to have been in distress and rent burdened before the pandemic. In fact, actual distribution numbers indicate that these programs have benefited the lowest income renters. The quarterly data on the demographics of ERA recipients indicate that as of year-end 2021, for ERA1, 63.6 percent had incomes less than 30 AMI, 22.7 percent had incomes in the 30 < 50 AMI range, and 13.7 percent had incomes in the 50 < 80 AMI range (authors' calculations from U.S. Department of the Treasury 2021d).

Assessing the effectiveness of the ERA program is difficult given both the slow rollout and the uncertainty about how many renters are actually in arrears. For example, an October 2021 Congressional Research Service report notes that "because there is no definitive estimate of renters in arrears and the amounts they owe, it is unknown whether all renters who are behind will be able to receive assistance with available funding. Estimates of the need for rental assistance vary and may depend on the data source and methodology...Whether existing ERA funding will be sufficient to address outstanding arrearages and

avoid widespread housing disruption when eviction moratoriums end is yet to be seen (Driessen, Perl, and McCarty 2021, page 14).”

Note that the \$46.55 billion in Congressionally allocated ERA money is more than twice as much as Zandi and Parrott’s (2021) estimate of the full amount of back rent owed. And, of course, those owing back rents with income over 80 AMI are not eligible. However, the program does cover up to three months of future rents and allows money for administrative expenses, neither of which was accounted for in their estimate. As a result, it is difficult to tell if the money will be sufficient to cover the COVID-19 arrears.

Going Forward

We are concerned that we have not seen the worst of the stress in the housing market for rent-burdened households. Rents are rising quickly in some markets. CoreLogic data covering the single-family rental market show national annual rent increases on the order of 12 percent for properties turning over in December 2021, and the increases are even more rapid in certain markets, with Miami up 35.7 percent and Phoenix up 18.9 percent (CoreLogic 2022). Apartment List shows even higher increases for multifamily properties (Salviati et al. 2022). However, all renters have not yet experienced a double-digit increase because not all tenants have renewed their lease and because landlords tend to give lower increases to renewing tenants, preferring to spread larger increases over several years. Nationally, rents for all apartments, not just those turning over, increased 3.3 percent in 2021 according to the Consumer Price Index. Going forward, this is likely to accelerate.

To the extent that rent increases faster than wages, the ranks of rent-burdened households will rise, particularly among lower-income renters. Indeed, the COVID-19 pandemic has a long tail, and it may leave many renters in more dire circumstances than they were in before the pandemic, with no more fiscal relief in sight. Meanwhile, the housing landscape has changed. Even though the eviction moratorium has been lifted, landlords are now aware that renter protections that make eviction more difficult, including moratoriums, are possible. The Avail survey results discussed earlier show landlords are protecting themselves by doing more rigorous screening of incoming tenants, including looking at their eviction history or demanding higher credit scores. This more rigorous screening means that once a renter runs into difficulties, subsequent rentals may be even more difficult to obtain, suggesting that evicted tenants will have even less choice in their next rental.

Neither the eviction moratorium nor the ERA policy response is a long-term solution for the rental market. Eviction moratoriums prevented immediate harm, but owed rental payments continued to accrue. The ERA program was put into place to assist lower-income households, but its erratic rollout prevented timely or easy access to these funds. While these programs surely helped prevent homelessness during the pandemic, there is still uncertainty over the

extent to which they will prevent evictions in the aftermath of the pandemic. Moreover, house price rises increased at an unprecedented rate, which has contributed to an increased wealth differential between renters and owners (Acolin, Goodman, and Wachter 2019). Indeed, even as homeowners enjoy an increase in house prices, renters will likely face large rent increases and more difficulties in becoming homeowners going forward. The crisis should prompt much needed conversations on growing inequities between these two groups.

Lessons Learned

Although EIPs and enhanced unemployment benefits were largely sufficient to ensure that moderate and higher-income renters who lost their jobs did not fall behind on rent, lower-income renters did show signs of increased distress. Those renters were already rent burdened before the pandemic. It appears that the pandemic worsened what was already a precarious situation and cash assistance was not sufficient to keep them from falling behind on rent.

In addition, the eviction moratorium was necessary to contain the health crisis. It was valuable to many families, particularly those who were already strained coming into the pandemic and were adversely affected by the pandemic. However, the cost of this moratorium was largely borne by the landlords, which has negative consequences for tenants going forward. In particular, landlords are deferring maintenance on their properties, and many are tightening criteria for new tenants. ERA was valuable to low-income families who were strained coming into the pandemic; nonetheless, a quicker, more streamlined rollout would have been beneficial for tenants and would have reduced the cost of the eviction moratorium for landlords.

The COVID-19 experience offers several lessons for policymakers in future recessions:

- Generous income replacement may be sufficient if policymakers are concerned only with the incremental effect of the recession on those who were employed in the formal market before the recession.
- Given generous income replacement, an eviction moratorium and ERA largely benefit renters who come into the recession already housing insecure. Eviction moratoriums have negative externalities for landlords and are second best relative to ERA. However, in the middle of a health crisis, eviction moratoriums are necessary.
- Along with generous income replacement, a successful ERA program could keep renter delinquency rates from rising during recessions and in their aftermath. Such a program must be streamlined, with a simple application, minimal documentation, and clear eligibility rules, like the successful forbearance program for homeowners discussed in the section of this chapter on mortgage borrowers.

- This crisis highlighted the need for a more permanent rental assistance safety net. The reality is that only one out of every four families that qualifies for federal rental assistance receives it. This leaves many vulnerable to any small shock, and when a crisis strikes, it could increase overcrowding and homelessness. A more permanent rental assistance safety net that captures more of the population would mean that in the next crisis, policymakers would be able to focus on a smaller share of people who fall through the cracks.
- We must invest in better data on renters and rental market conditions, both delinquencies and evictions. As we have shown, the data underlying this chapter are far from robust, making it impossible to do a rigorous and conclusive analysis of the pandemic policy response. The lack of good pre-pandemic data is particularly problematic because so many renters were in a precarious position before 2020, making it hard to disentangle the effects of the pandemic from prior housing instability.

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Lessons Learned from Support for the State and Local Sector during COVID-19

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Introduction

State and local governments are significant players in the U.S. economy. Employment by state and local governments represents about 13 percent of total U.S. employment, a larger share than the federal government. State and local tax revenues represent about 9 percent of GDP, approximately half the share of federal tax revenues.

Unlike the federal government, virtually all state and local governments have to balance their operating budgets; they cannot borrow to finance large deficits. Revenue losses experienced during recessions have to be financed by savings or offset by spending cuts or tax increases. Governments typically make most of these adjustments on the spending side, likely because tax increases during economic downturns are particularly unpopular. Reductions in spending deprive residents of valuable services and weaken the macroeconomy. Tight spending at the state and local level in the aftermath of the Great Recession was a factor behind the slow recovery. Tight budgets are particularly problematic during a pandemic because much of the nation's public health infrastructure is at the state and local level.

In the spring of 2020, many analysts were projecting considerable revenue losses in the state and local sector—with some estimates suggesting losses of up to \$900 billion over two years. In addition, state and local governments were facing new demands on spending arising from the need to address

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pandemic-related public health issues. Congress acted swiftly to provide aid. The Coronavirus Aid, Relief, and Economic Security (CARES) Act, enacted in March 2020, provided significant aid to state and local governments—roughly \$350 billion—and legislation passed in December 2020 and the American Rescue Plan (ARP) enacted in March 2021 provided an additional \$640 billion for a total of close to \$1 trillion. This was far more than the roughly \$275 billion provided to state and local governments during the Great Recession (Congressional Research Service 2019). In addition, the Federal Reserve (the Fed) launched the Municipal Liquidity Facility (MLF) to ensure that state and local governments had access to credit.

So, what happened to state and local government revenues, employment, and spending during the first two years of the pandemic? Revenues did not decline nearly as much as had been first feared and federal aid was more than sufficient to offset any revenue losses in every state. Nevertheless, state and local government employment declined sharply, and the decline has been quite persistent: employment by state and local governments in February 2022 was three percent below the January 2020 level. Looked at another way, in February 2022, the state and local sector accounted for 23 percent of the shortfall in U.S. employment from its pre-pandemic trend.² Total nominal state and local spending, as measured by the National Income and Product Accounts (NIPA), (Bureau of Economic Analysis 2021b).

Thus, despite a large and rapid federal response, the state and local sector once again appears to be lagging most other sectors of the economy. Of course, unlike in the aftermath of the Great Recession, policymakers are now more worried about excess demand than insufficient demand, so the weakness in the state and local sector is much less of a concern from a macroeconomic perspective. Still, it is helpful to understand what happened and why, and what that might tell us about responses to future downturns.

This chapter addresses five questions:

1. Why were the revenue projections at the beginning of the pandemic so inaccurate?
2. How much aid did state and local governments receive, and was it sufficient to address revenue losses and increased costs related to the pandemic spending?
3. How well did the Fed's MLF work?
4. Why did employment decline so much? How much was specific to the pandemic, and how much was related to budget concerns?

2. For this calculation, I assume that, absent the pandemic, both total and state and local employment would have increased 0.7 percent per year, the annual rate of increase CBO projected for total employment growth between 2019Q4 and 2021Q1 in its January 2020 economic projection (CBO 2020a).

5. What are state and local governments doing with all the federal aid they have received?

I conclude with a discussion of the lessons that can be learned from the experiences during the pandemic, which I summarize here:

- Policies that provide fiscal support to households and businesses indirectly support state and local revenues and should be considered in determining the amount of direct aid to state and local governments.
- In order to prevent layoffs, aid to state and local governments should be automatic or provided early in a recession.
- Aid should go directly to states *and* localities instead of only to state governments where possible, and should have few conditions on its use.
- State and local governments are reticent about using one-time federal aid to finance ongoing expenditures, which might preclude aid from being used for the most effective purposes.
- The ability of state and local governments to borrow from the Fed in a time of crisis can serve as an important backstop that can help stabilize municipal bond markets.
- Timelier data on state and local government revenues and expenditures are needed to assess ongoing economic conditions and to evaluate policy.
- The lesson of the Great Recession (i.e., that inadequate aid to state and local governments can hamper an economic recovery) should not be discarded because of the recent experience; the pandemic created unusual economic conditions that are not likely to recur in future recessions.

Projected and Realized Revenue Losses

As shown in Table 6.1, virtually all analysts and policymakers projected large and prolonged revenue losses. For example, Bartik (2020) projected losses of \$899 billion in fiscal years 2020 and 2021 while Bivens and Walker (2020) projected losses of \$345 billion. Others projected losses for only a subset of the state and local revenues (e.g., just state taxes or just income and sales taxes). These ranged from \$130 billion (White, Crane, and Seitz 2020) to \$395 billion (McNichol, Leachman, and Marshall 2020). Most of these projections relied on historical relationships between state and local revenues and the unemployment rate or the growth rate of personal income. Auerbach et al. (2020) took a different approach, using a bottom-up method to project revenues by state for each type of revenue. All revenue projections, regardless of approach, relied on economic forecasts.

In fact, although tax revenues dipped at the onset of the pandemic, they quickly recovered and have been quite healthy since. Table 6.2 compares tax revenues from the U.S. Census Bureau's Quarterly Summary of State and Local Tax Revenue to a baseline where revenues increased 4 percent per year from

TABLE 6.1

Projections of Revenue Losses From COVID in the State and Local Sector

Authors	Revenue or Spending	Revenue Losses FY2020 + FY2021 (billions)	Economic Forecast Underlying Estimate	Methodology
Bivens and Walker (April 2020) Economic Policy Institute	State and local taxes	\$345	Goldman Sachs (April 2020)	Historical relationship augmented for assumed local revenue effect. A 1% increase in unemployment associated with a \$60 billion decline in state and local revenues.
McNichol, Leachman, and Marshall (April 2020)	State taxes	\$395	CBO (April 2020)	Historical relationship: 1% increase in unemployment rate lowers revenues 3.7%.
White, Crane and Seitz (April 2020) Moody's Analytics	State revenues general funds	\$130 baseline; \$203 more severe scenario	Baseline: Max 10% decline real GDP, gradual recovery. More severe: Max 14% decline real GDP, gradual recovery.	Proprietary model that includes state-by-state regressions of state revenues on economic revenues.
Bartik (May 2020) Upjohn Institute	State and local taxes	\$899	CBO (April 2020)	Historical relationship augmented for assumed local revenue effect. 1% increase in unemployment lowers state and local revenues by \$60 billion.
Clemens and Veuger (June 2020)	State income and sales tax	\$148	CBO (April 2020)	Historical relationship: 1% decline in personal income lowers revenues by 1.6%.
Whitaker (June 2020)	All state and local revenue (including fees, charges, etc.)	\$200–\$490	Best: Recovery complete by 2020 Q4. Worst: Second wave shutdown 2020 Q4. Economy recovered by Q4 2021.	For income taxes: estimate wage declines and assume tax revenues decline proportionally. For sales taxes, use national changes in portions of PCE likely subject to sales tax.
Dadayan (July 2020) Urban Institute Tax Policy Center	State taxes	\$200	States forecasts	Estimated for all 50 states based on forecast data from 27 states.
Auerbach, Gale, Lutz, and Sheiner (September 2020)	State and local taxes and fees	\$270 (calendar years not fiscal years)	CBO (July 2020)	Detailed projections of tax bases and tax schedules.

TABLE 6.2
State and Local Government Revenues During the Pandemic

	Revenue Losses Relative to Counterfactual 4% Growth (in billions)	
	FY2020	FY2021
Total current tax receipts	-71	145
Personal Income taxes	-38	70
Sales taxes	-20	6
Property taxes	-4	44
Taxes on corporate income	-9	25

Source: Census Bureau 2021; author’s calculations.

Note: This table reports the difference between revenues collected in FY2020 and FY2021 and revenues that would have been collected had they increased at a 4 percent annual rate from 2020 Q1 on.



2020Q1 on, a bit above what state budget officials expected for state fiscal year (FY) 2021 right before the onset of the pandemic (NASBO 2020). State and local taxes were \$71 billion lower in state FY 2020 but were \$145 billion *higher* in state FY 2021 (U.S. Census Bureau 2021).^{3,4} Looking at the components, revenues were below baseline in FY 2020 but above baseline by FY 2021. This is in contrast to the Great Recession, during which revenues fell sharply and remained depressed for many years.

Why Were the Projections So Off?

It is important to understand why the historical relationships between state and local revenues and projected economic conditions performed so poorly in predicting actual revenue collections, particularly because many economists have argued that federal aid to state and local governments should be triggered automatically when economic conditions reach a certain threshold. For example, Fiedler, Furman, and Powell (2019) argued that the federal share of Medicaid should be increased by 3.8 percentage points for each percentage point by which a state’s unemployment rate exceeds a threshold. Using the historical

3. Part of the decline in FY 2020 and recovery in FY 2021 reflects a shift in tax collections from the delay in the tax filing deadline for individual and corporate income taxes.
4. Throughout this chapter, I define the fiscal year as beginning on July 1 and ending on July 30—that is, fiscal year 2020 is from July 1, 2019, to June 30, 2020. This timing is used by 46 states. The fiscal year begins on April 1 for New York, September 1 for Texas, and October 1 for Alabama, Michigan, and the District of Columbia.

relationship between unemployment and state revenues, they estimated that this increase in the Medicaid matching rate would be sufficient to offset two-thirds of a state's revenue losses. A key question, then, is whether these historic relationships broke down during the pandemic or the economic forecasts on which the revenue losses were based were too pessimistic.

Auerbach et al. (2020) examined the historical relationships between state and local revenues and economic conditions (reproduced in Table 6.3). They argued for excluding 2009, a particularly unusual year, and including a measure of the stock market performance when estimating the historical relationships. The inclusion of stock market performance was particularly important during the pandemic because, rather than declining as it does during most downturns, the stock market soared, boosting household wealth and taxable income. With these adjustments, they showed that the predicted losses were smaller than many others had projected.

Auerbach et al. (2020) also argued that this recession was sufficiently different from previous episodes that historical relationships might be misleading. First, social distancing and remote work meant that sources of revenue that are not typically cyclical (e.g., gas taxes, airport fees, motor vehicle licensing fees, etc.) plummeted. Second, low-wage workers suffered disproportionately from this recession, meaning that any given change in the unemployment rate had a smaller effect on consumption and personal income and thus on state and local revenues than is usually the case. Finally, generous federal aid to households strengthened household finances, thus supporting both sales taxes and property taxes, and some of the federal aid directly boosted taxable income. Many states tax unemployment benefits and Paycheck Protection Program (PPP) loans boosted taxable profits.⁵

Another reason that the revenue forecasts were so off, however, is that the analysts relied on economic forecasts that proved far too pessimistic. In July 2020, for example, the Congressional Budget Office (CBO) projected that, as a result of the pandemic, real GDP would be 8 percent below its pre-pandemic forecast by the end of 2020 and 5 percent below it by the end of 2021 (Congressional Budget Office 2020a and 2020b). Instead, real GDP was just 5 percent below the pre-pandemic projection in 2020Q4 and 1 percent below in 2021Q4. Similarly, CBO projected that the unemployment rates in Q4 of 2020 and 2021 would be 10.5 percent and 7.6 percent, respectively. Instead, they were 6.8 percent and 4.2 percent, respectively. Private sector forecasts were similarly overly pessimistic.

5. During normal times, 35 states tax UI benefits. However, 25 of these states adopted the federal exemption included in the American Rescue Plan (enacted in early 2021) on the first \$10,200 of benefits for most taxpayers or waived taxes on UI all together (Mengle 2022). Similarly, although PPP loans were not taxable, it was originally thought that companies would not be able to deduct the costs paid out of the loans (i.e., they could not double dip). However, in the legislation enacted in December 2021, the Consolidated Appropriations Act of 2021, Congress explicitly said that companies could do this. Many states automatically conform with the federal tax law, so this reduced taxes for states as well.

TABLE 6.3

Predicted Revenue Losses Given Actual Economic Outcomes, Total FY2020 and FY2021 (Billions)

A. State and Local Tax Revenues and the Business Cycle (1985–2019)

		All	Excluding 2009	Including Stocks	Including Stocks and Excluding 2009
Dependent Variable: Log Change in Real per Capita State and Local Income Taxes					
Change in UR	Coefficient	-4.90	-3.50	-3.30	-2.70
	Adjusted R ²	0.56	0.24	0.65	0.35
Log change real per capita personal income	Coefficient	2.00	1.40	1.40	1.10
	Adjusted R ²	0.58	0.28	0.65	0.36
Log change real per capita "taxable" personal income	Coefficient	1.50	1.10	1.10	0.89
	Adjusted R ²	0.61	0.33	0.67	0.40
Dependent Variable: Log Change in Real per Capita State and Local Sales Taxes					
Change in UR	Coefficient	-3.00	-2.30	-2.40	-2.00
	Adjusted R ²	0.72	0.44	0.75	0.49
Log change real per capita personal income	Coefficient	1.10	0.70	0.80	0.60
	Adjusted R ²	0.60	0.27	0.64	0.31

B. Predicted Revenue Losses Given Actual Economic Outcomes, Total FY2020 and FY2021, Billions

	All	Excluding 2009	Including Stocks	Including Stocks and Excluding 2009	Actual Change
Income Tax Revenues					
Change in UR	-\$116	-\$83	-\$57	-\$46	\$48
Log change real per capita personal income (excluding EIPs)	\$5	\$3	\$23	\$19	\$48
Log change real per capita "taxable" personal income (excluding UI)	-\$44	-\$32	-\$14	-\$11	\$48
Sales Tax Revenues					
Change in UR	-\$70	-\$54	-\$49	-\$41	-\$14
Log change real per capita personal income	\$23	\$15	\$25	\$19	-\$14

Source: Bureau of Economic Analysis 2021b; Bureau of Labor Statistics 2022e; Wilshire Associates 2022.

Note: Change in personal income relative to a counterfactual in which real income grows 2% per year.

Panel B of Table 6.3 shows the decline in revenues over the FY 2020 and FY 2021 period that would be predicted from the regressions using actual economic outcomes. Using the simple unemployment rate regression in column 1, the actual increase in the unemployment rate would suggest income tax losses of \$116 billion, compared to the actual gain of \$48 billion, and sales tax losses of \$70 billion, relative to an actual loss of \$14 billion. These predicted losses are much smaller than many of the losses predicted in the spring of 2020, but they are still substantial. Even when excluding FY 2009 and including changes in stock market performance, the losses using the unemployment rate regression are predicted to be \$87 billion for both sources of revenues combined, rather than the \$34 billion gain that actually occurred.

The predictions using personal income align more closely with actual tax collections. Using the regression of income tax changes on the change in total personal income (excluding the Economic Impact Payments [EIP]) suggests income tax gains of between \$5 and \$22 billion, depending on the specification, which is closer to the actual gain of \$38 billion. But using what is a better-specified regression that relates revenues to a measure more closely approximating taxable income (i.e., a measure that only includes sources of income subject to tax) does less well. It predicts income tax losses of between \$11 billion and \$44 billion.⁶ Turning to the sales tax predictions, the huge increase in personal income would have predicted somewhat stronger sales tax collections than actually collected.

What does this exercise suggest about the usefulness of these types of regressions for predicting revenue losses in future recessions? First, to a large extent, the overly pessimistic revenue forecasts were the result of overly pessimistic economic forecasts. Policies that automatically provide aid to state and local governments when economic conditions warrant it would automatically adjust if economic projections turned out better (or worse) than expected. In other words, the very large forecast errors during the pandemic do not imply that these types of automatic stabilizer policies are misguided.

Second, changes in the unemployment rate or personal income are not great predictors of revenue losses, even at the aggregate level. Regressions that do not include FY 2009 had a relatively poor fit even before the pandemic (R^2 ranging from .24 to .44, depending on the regression).⁷ This finding may

6. Personal income includes a lot of items that are not taxable and that should not affect tax receipts, including employer-provided health and pension benefits, government transfers like Medicare, Medicaid, and the Supplemental Nutrition Assistance Program, imputed rental income on owner-occupied homes, and income earned by the nonprofit sector. This regression excludes those components of personal income. Note that the regressions also use lagged stock market performance, so the big gains in the stock market in 2021 are not affecting predicted revenues.

7. This fact is perhaps not surprising. Recessions differ from each other, and economies and tax structures differ across states. For example, New York is highly dependent on tourism, and its lower-income individuals were deeply affected by the pandemic, which is reflected in the

weaken the case for automatic aid to state and local governments, although such policies would still be helpful even if the amount of aid provided does not match revenue losses particularly well. For example, policies that are geared toward replacing two-thirds of the lost revenues on average would help support an economic recovery—even if that aid sometimes proves too large and sometimes too small. While Congress acted swiftly and forcefully this time to support state and local governments, that may not be the case the next time.

Third, general fiscal support to households and businesses can indirectly support state and local governments. When contemplating discretionary aid to state and local governments during future downturns, it is important to account for other policies that might have economically significant effects. The generous fiscal support enacted during the pandemic—which not only expanded Unemployment Insurance (UI) but also the EIPs and PPP—meant that (a) the economic recovery was stronger than it otherwise would have been, and (b) even holding economic conditions constant, high unemployment did not translate into tight household budgets, thus supporting sales, excise, and property tax collections for state and local governments. This is likely an important reason why relying on increases in the unemployment rate to predict state and local revenues losses yielded less accurate predictions than relying on changes in personal income, even though both measures of the economy have been similarly effective for predicting revenues historically.⁸

How Much Variation Is There in State and Local Revenues Across the States?

When thinking about the effects of tight budgets on the state and local sector, it is important to consider variation across the states: budget surpluses in one state will not compensate for budget deficits in another in terms of the services provided to the public. And if states are more likely to cut spending when their budgets are in deficit than they are to raise spending when they are in surplus, as suggested by Sorenson and Yosha (2001), cross-state variation in revenue losses can also have implications for the level of employment and the macroeconomy more generally.

The data available now only allow us to examine variation in tax collections by state governments; we have no information on local government revenue

unemployment rate and even in employment growth. However, its economic and revenue structure—a highly unequal economy, a financial-sector-driven economy, and a tax structure that focuses on these features—meant that revenue growth was strong. Other tourism-focused economies were not as fortunate. There is likely no single variable or single combination of variables that can plausibly foretell fiscal stress across different kinds of recessions.

8. In addition, as discussed above, unemployment during this recession was unusually concentrated among low-wage workers, meaning that a given increase in unemployment had a smaller effect on total wages.

collections.⁹ Online Appendix Figure 6.1 reports the change in state revenues averaged over FY 2020 and FY 2021 relative to revenues in FY 2019. There is a great deal of variation across the states. States that had the largest revenue losses or the smallest revenue gains were mostly energy producers or states heavily dependent on tourism.¹⁰ One exception is Oregon, which experienced large revenue losses in FY 2020 for a reason unrelated to the pandemic: the state’s “kicker” law refunds tax collections if they come in two percent or more above projections over the previous two years, which was the case in 2020 because of strong revenues before the pandemic.

Still, aggregating both FY 2020 and FY 2021, revenues were only lower in 10 states than they would have been under a pre-pandemic baseline of 4 percent annual growth. Revenues in Alaska, where 90 percent of general fund revenues come from oil, were the weakest: roughly 35 percent below a pre-pandemic baseline, reflecting weak oil demand and low oil prices (Understanding Alaska’s Budget n.d.).

Regression analysis of revenue losses, shown in Online Appendix Table 6.1, find that oil and tourism states had lower revenues on average over the two years, but other state characteristics—including the Biden share of the vote (a measure of political leanings and attitudes toward the pandemic); the change in the unemployment rate; personal income growth; the share of tax receipts coming from sales, income, and property taxes; and even states’ own predictions for revenue declines early in the pandemic—had no predictive power for total state revenues over the two years.

Federal Support to State and Local Governments

Federal Aid

In response to the large projected revenue losses and concerns about increased demands on state and local budgets, Congress increased aid to state and local governments by about \$1 trillion—far more than the roughly \$275 billion provided during the Great Recession. Table 6.4 details the sources of aid. About \$250 billion was provided through legislation enacted in the spring of 2020 (i.e.,

9. The U.S. Census Bureau will eventually publish data on local government revenues by state; however, these data, which come from the Annual Survey of State and Local Government Finances, come out with a long lag: data for FY 2020 (ending for most states on July 1, 2020) will not be available until around June 2022.

10. The states that experienced the greatest losses or slowest revenue growth over FY 2020 and FY 2021 were, in order, Alaska, North Dakota, Wyoming, Texas, Hawaii, Oklahoma, West Virginia, New Mexico, Oregon, Nevada, Florida, New Hampshire, and the District of Columbia. Of these, Hawaii, Nevada, Florida, New Hampshire, and the District of Columbia are tourism states while, other than Oregon, the rest are energy producers.

TABLE 6.4

Total Enacted Aid to State and Local Governments (Billions)

	Families First Coronavirus Response Act (Mar. 18, 2020)	CARES Act (Mar. 27, 2020)	Consolidated Appropriations Act, 2021 (Dec. 27, 2020)	American Rescue Plan (Mar. 11, 2021)	Total
Total	\$105	\$250	\$99	\$542	\$996
General Aid	\$100	\$150		\$350	\$600
Coronavirus Relief Fund		\$150			\$150
Coronavirus State and Local Fiscal Recovery Funds				\$350	\$350
Enhanced Medicaid matching rate ^a	\$100				\$100
Targeted Aid	\$5	\$100	\$99	\$192	\$396
Aid for Unemployment Insurance administrative expenses	\$5	\$12			\$16
Aid to K–12		\$17	\$56	\$123	\$195
Aid to public institutions of higher education ^b		\$12	\$19	\$35	\$66
Aid to health providers ^b		\$35	\$1	\$2	\$37
Aid to transit agencies and transportation infrastructure grants		\$25	\$24	\$33	\$81

Source: Committee for a Responsible Federal Budget 2020; Ochieng et al. 2022; Department of Education 2021.

Note: (a) Author's estimated value assuming public health emergency ends on July 1, 2022. (b) Author's estimate of share going to public institutions.



the start of the pandemic). First, in mid-March, Congress increased the share of Medicaid spending financed by the federal government by 6.2 percentage points, retroactive to the start of 2020 and effective until the end of the public health emergency. This enhanced match rate increased federal Medicaid grants to state and local governments by about \$40 billion per year. Presuming the public health emergency is declared over by June 2022, this amounts to approximately \$100 billion in total. As part of that enhanced federal payment, states were prohibited from terminating Medicaid coverage for existing beneficiaries or to tighten eligibility criteria, leading to a surge in Medicaid enrollment. Nonetheless, the net effect was to lower overall state Medicaid spending, thus relieving pressure on state budgets (Auerbach et al. 2020).

Second, as part of the CARES Act, Congress created the Coronavirus Relief Fund (CRF), a \$150 billion fund allocated to state and local governments for the express purpose of addressing unanticipated expenses related to the pandemic. In addition, the CARES Act included provisions to help cover higher UI administrative expenses and provided targeted aid to public educational institutions, health providers (including public hospitals), and transit agencies. Additional targeted aid was enacted in the Consolidated Appropriations Act in December 2020 and the ARP in March 2021. The ARP also included an additional \$350 billion in direct aid to states.

How Was Aid Distributed Across the States, and How Flexible Was It?

The CRF provided \$142 billion in aid to state governments and some local governments and \$8 billion to tribal governments. Local governments of entities (counties, cities, townships, etc.) with a population of at least 500,000 were eligible to apply, with the amount paid to state government reduced by the aggregate amount that was disbursed to eligible local governments within the state. Aid was distributed based on population, but states received a minimum of \$1.25 billion, making it much more generous for smaller states. For example, Vermont, South Dakota, and Montana each received aid exceeding 20 percent of 2020 own-source revenues (i.e., revenues excluding federal grants), whereas Iowa, Missouri, Mississippi, California, Connecticut, New York, and Washington received aid of 6 percent of own-source revenues or less (Auerbach et al. 2020).

The ARP's Coronavirus State and Local Fiscal Recovery Funds (CSFRF and CLFRF) provided direct aid to many more entities than the CRF: While only 171 local governments received direct funding through the CARES Act's CRF, tens of thousands of local governments received ARP's direct aid, with the total amounts provided to states, counties, cities, tribal government, territories, and other local governments specified by Congress.¹¹ States received a total of \$195.3 billion, with \$25.5 billion allocated equally across the states and the District of Columbia (again providing much more generous aid to small states) and the remaining \$168 billion distributed on the basis of the number of unemployed individuals over the three-month period ending December 2020.¹² Aid to local governments was distributed based on population in the case of counties and economic need in the case of cities.

The funding provided by the relief funds—the CRF, the CSFRF, and the CLFRF—was large enough to more than offset state revenue losses in *every* state.

11. For a description of both relief funds, including allocations methods, specified uses, and actual allocations, see U.S. Department of the Treasury (n.d.).

12. Also, the District of Columbia got an additional \$254.9 billion to compensate it for receiving less than other states in CARES Act funding.

And given their dependence on property taxes, local governments likely had even more muted revenue losses than states, so it is almost certain that the aid exceeded aggregate revenue losses by both state and local governments in each state. That is not even counting the other sources of aid (e.g., higher Medicaid match rate, aid targeted to K–12 education, public health providers, transit agencies, etc.) that in aggregate was about equal to the size of the relief funds.

There were, however, restrictions on the purposes to which the federal aid could be put. For example, the CARES Act's \$150 billion CRF was only to be used to cover expenses incurred due to the public health emergency, not to fund any items that were accounted for in the most recently approved budget. That is, they were explicitly not intended to cover any revenue losses. Of course, funding is fungible, so the restrictions on the use of particular funds may not bind on state and local governments. Furthermore, by the summer of 2020, Treasury had issued guidelines that allowed fairly broad use of the funds (Treasury 2020).¹³ However, it is possible that these restrictions slowed the use of funds and possibly contributed to the declines in employment in the sector.

The funds made available by the ARP were far more flexible than the aid provided by the CARES Act. In particular, recipients of ARP funds were permitted to use the aid to replace lost public sector revenue, fund public health efforts, and address the economic consequences of the pandemic (including covering the costs of UI), provide premium pay to public sector workers, and invest in water, sewers, and broadband infrastructure.¹⁴ However, the ARP funds, which account for almost 60 percent of the total federal aid to state and local governments enacted during the pandemic, came too late to prevent employment losses in the sector, as I discuss below.

Federal Reserve Lending to State and Local Governments

In addition to direct fiscal support to state and local governments, the federal government also took actions to reduce strains in the municipal bond market. In March 2020, fearing that massive revenue losses would leave state and local governments unable to service their debts, investors pulled a record \$45 billion from muni funds (mutual funds that hold the bonds of state and local governments). Spreads between the yield on muni bonds and Treasuries soared to levels not seen since the Great Depression, and many governments had trouble borrowing. The strains in the muni market were particularly problematic because

13. For example, any costs related to public health or safety were deemed an acceptable use of CARES Act funding.

14. The funds were also explicitly prohibited from being used to finance tax cuts. However, the Treasury's implementation of that restriction leaves room for tax cuts. In particular, so long as tax collections are above 2019 taxes adjusted for inflation, the Treasury will not claw back any ARP money from states that cut taxes (Auxier 2021). The ARP funds were also explicitly prohibited from being used to pay down unfunded pension liabilities.

the traditional April 15 tax filing deadline was pushed to July 15, which meant much lower cash flow than expected and greater need for short-term borrowing.

To support the flow of credit to state and local governments, the Fed launched the Municipal Liquidity Facility (MLF) on April 9, 2020.¹⁵ The facility initially was designed to purchase up to \$500 billion of short-term notes directly from U.S. states, including the District of Columbia; U.S. counties with a population of at least two million residents; and U.S. cities with a population of at least one million residents. The facilities were later expanded to counties with a population of at least 500,000 and cities with a population of at least 250,000. This was the first time that the Fed made direct loans to state and local governments.

Under the MLF, the Fed would purchase newly issued state and local government bonds at normal spreads over Treasury bonds (rather than the elevated spreads prevailing in the muni market) plus a fee of 100 basis points, later reduced to 50 basis points. The Treasury and the Fed jointly set the terms to virtually guarantee that the program would not lose money in aggregate. Nonetheless, any losses incurred by the Fed on these loans would be absorbed by some of the \$454 billion provided in the CARES Act to the Treasury to be used to backstop Fed lending to businesses and state and local governments.

Take-up of MLF loans was very low: only the state of Illinois and the New York Metropolitan Transportation Authority made use of the program, borrowing \$3.20 billion and \$3.36 billion, respectively. Yet the MLF is widely viewed as a successful intervention because it stabilized yields in the private muni market. Bordo and Duca (2020), for example, estimate that muni yields could have risen by as much as 8 percentage points more than they did in mid-April had the Fed not launched the MLF. They argue that the MLF served as an important backstop that eased investor fears: the availability of Fed loans meant that state and local governments would be able to finance their debt even if revenues plummeted. As might be expected, the benefits of the MLF were particularly large for low-rated issuers. Comparing issuers just below and above the population eligibility cutoff, Haughwout, Hyman, and Shachar (2021) found that eligible low-rated issuers saw yields fall by about 72 basis points relative to comparable ineligible issuers.

15. The Fed also supported the muni market prior to the launch of the MLF. In particular, on March 23, 2020, the Fed announced that it would begin accepting variable rate muni demand notes (long-term municipal bonds offered through money market funds) as collateral at its new Money Market Mutual Fund Liquidity Facility. Haughwout, Hyman, and Shachar (2021) note that municipal yields and other measures of market distress started falling the day the Fed made that announcement.

Employment of State and Local Workers

One motivation for the generous aid provided to state and local governments was to allow them to finance pandemic-related expenses without laying off workers. Yet, despite muted revenue losses in FY 2020, healthy revenue gains in FY 2021, very generous federal aid, and ample borrowing capacity, state and local employment fell sharply during the pandemic and has yet to fully recover. State and local governments began laying off workers in March 2020, and by May 2020 seasonally adjusted employment was 7 percent lower than it had been in January 2020.

Analyses of state and local employment typically focus on four types of workers: state workers in the education sector (about 2.5 million in 2019), state workers outside of education (2.7 million), local education workers (8.0 million), and local workers outside of education (6.6 million). As shown in Figure 6.1a, in the first few months of the pandemic, employment fell sharply for state government workers in the education sector (solid blue line) as enrollment in institutions of higher education declined but fell only slightly for workers in other sectors of state government. As shown in Figure 6.1b, in local government, employment fell sharply in both the education and noneducation sectors.

Employment in education at both local and state governments began to recover in January 2021; the recovery in local employment outside of the education sector began in the fall of 2020.¹⁶ By January 2022 state education employment was a bit above its January 2020 level while employment at local governments remained 4 percent below. Of course, employment would have been expected to increase somewhat over two years, suggesting somewhat larger shortfalls in employment relative to a pre-pandemic baseline.¹⁷

These patterns are in sharp contrast to those in the Great Recession, shown by the green lines in Figure 6.1. In particular, state education employment increased in the Great Recession as enrollment in higher education increased, and employment did not begin declining for other government workers until close to two years after the start of the Great Recession. But state and local government employment, other than in state education, fell consistently for many years thereafter, not even beginning to recover until the end of 2012.

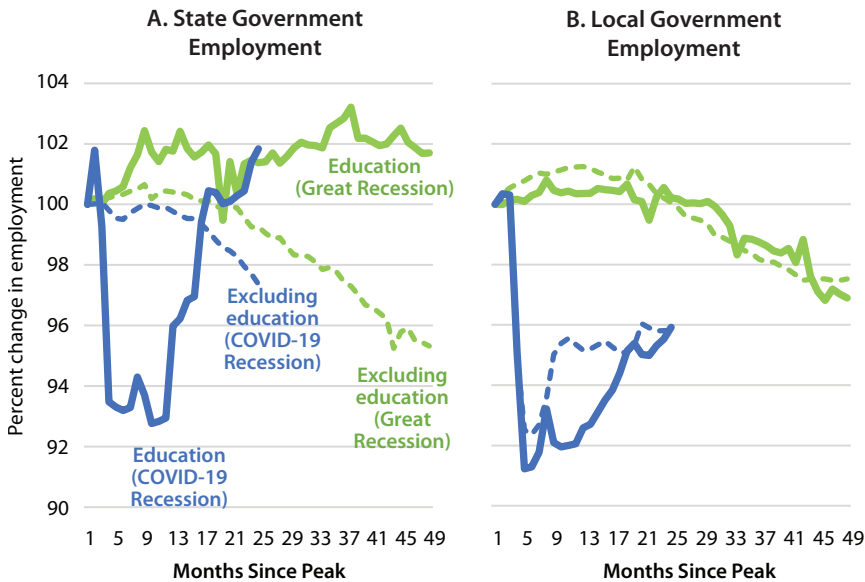
Understanding the patterns of employment declines during the pandemic is critically important to understanding the efficacy of federal aid to state and local governments. Is it the case that aid from the federal government is

16. The small increases in local and state education employment observed in the summer of 2020 likely reflect the unusual seasonal pattern in 2020. Many workers who typically would have been laid off in the summer (e.g., cafeteria workers, bus drivers, maintenance workers, etc.) were instead laid off in the spring. As a result, the typical summer layoffs were smaller than normal, and this caused an increase in seasonally adjusted employment in the summer.

17. It is not clear what a good counterfactual baseline would be. Over the three years preceding the pandemic, employment at state and local governments increased about 0.75 percent per year, but the increase in 2019 was 1.1 percent.

FIGURE 6.1

Employment Trends during the Great Recession vs. the COVID-19 Pandemic



Source: Bureau of Labor Statistics 2022a.

Note: Seasonally adjusted monthly employment relative to December 2007 for Great Recession and January 2020 for the COVID-19 pandemic recession.

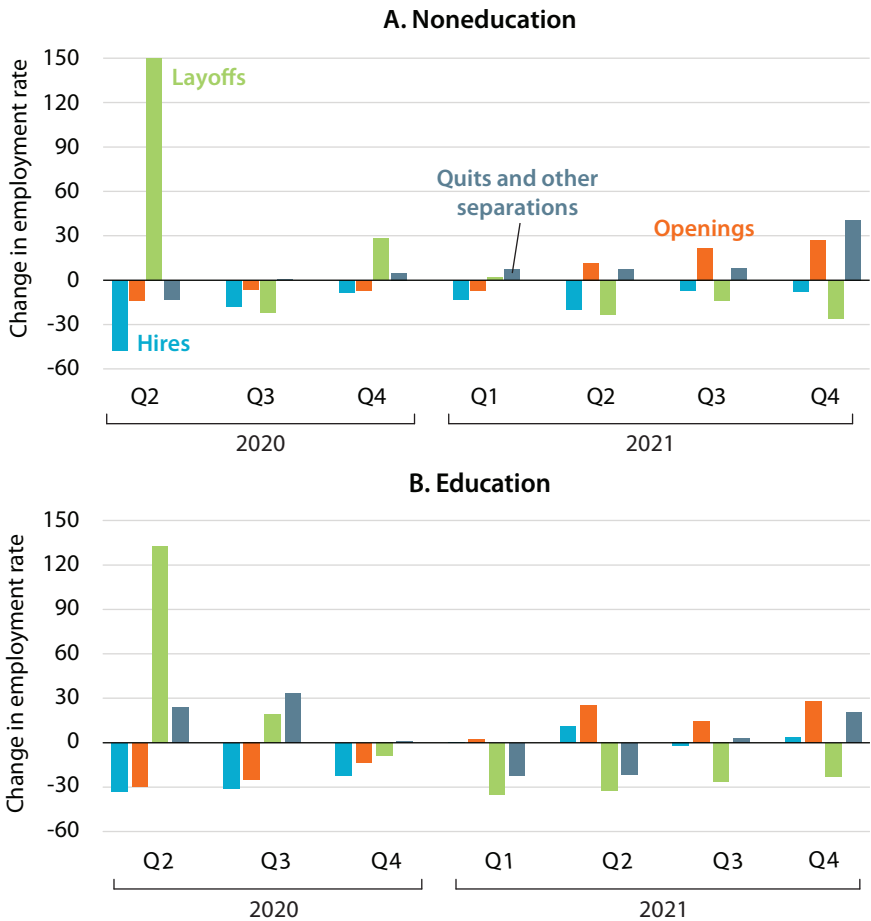


generally ineffective at supporting employment, or was the pandemic just too unusual to be informative? In particular, we need to understand the extent to which the employment declines reflected actual or expected tight budgetary conditions versus pandemic-specific conditions, like office and school closures and lower supply of workers to the sector because of COVID-19 fears or vaccination mandates.

Figure 6.2 shows the changes relative to January 2020 in data on seasonally adjusted job openings, hiring, and job separations from the Job Openings and Labor Turnover Survey (U.S. Bureau of Labor Statistics 2022c). These data are available for state and local education workers combined as well as state and local noneducation workers combined. Examining the patterns over time, most of the reductions in employment in the spring of 2020 came from the employer side: the number of employees hired fell between 30 percent and 50 percent while layoffs surged. In the education sector, quits and other separations, which include retirements, also increased sharply in the spring and summer of 2020.

FIGURE 6.2

State and Local Job Openings and Labor Turnover



Source: Bureau of Labor Statistics 2022c.

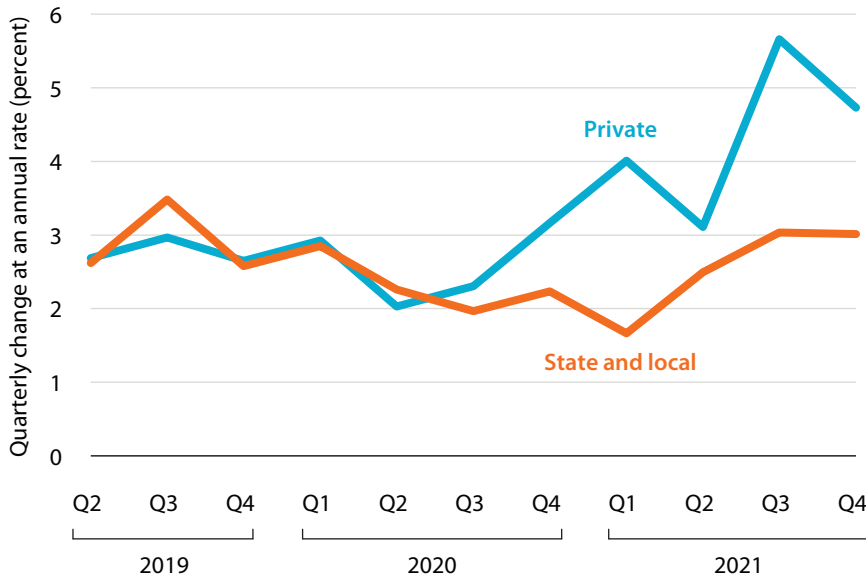
Note: Change in seasonally adjusted levels relative to January 2020.

The story is a bit different beginning in the second quarter of 2021, after vaccines were rolled out. Then, layoffs actually fell below pre-pandemic levels, accounting for most of the employment increases, while job openings rose. Hiring rates, however, remained muted. The lackluster pace of hiring may reflect the fact that wages in the public sector did not keep up with private sector wages reducing employers' abilities to attract workers (see Figure 6.3).

It seems clear that at least part of the surge in layoffs in the spring of 2020 reflects school and office closures. Cafeteria workers, bus drivers, classroom

FIGURE 6.3

Change in Wages, Private Sector and State and Local Sector



Source: Bureau of Labor Statistics 2022b.

Note: Change from previous quarter in employment cost index for total compensation, annual rate.

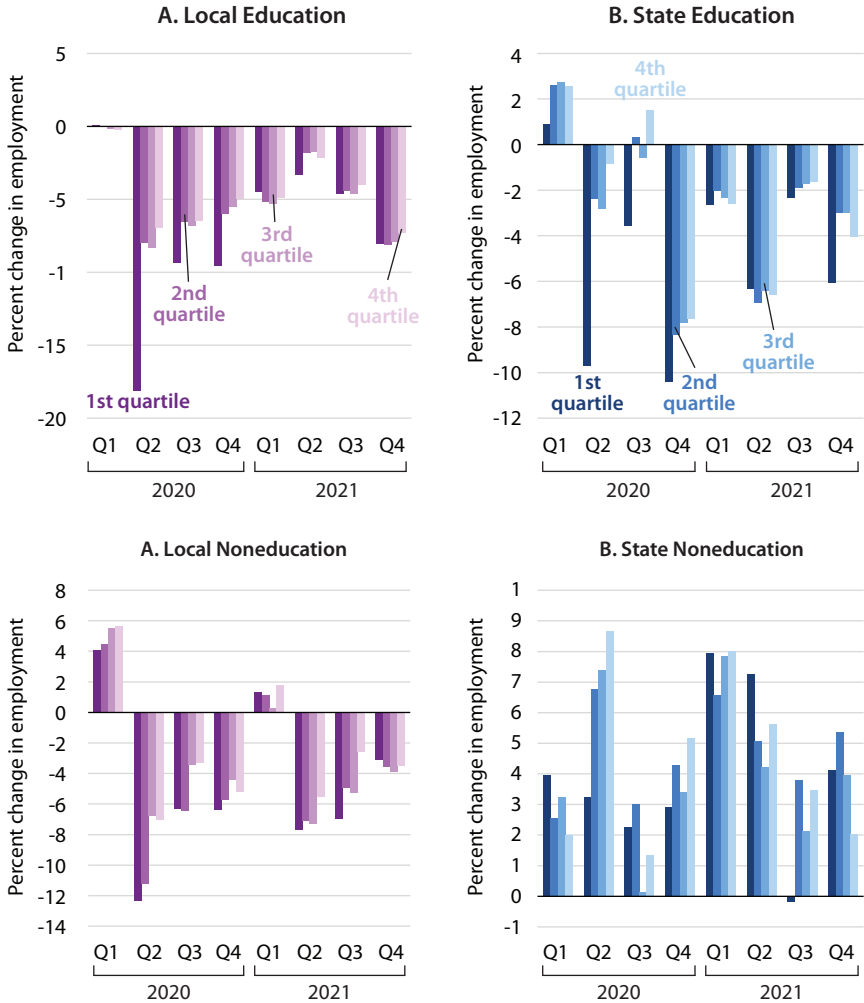


aides, and office workers were no longer necessary; furthermore, the availability of generous federally financed UI meant that laying off workers instead of keeping them on the payroll was beneficial to both the government employer and the workers. Evidence that support staff were more likely to be laid off initially comes from the distribution of job losses across wage quartiles. The data in Figure 6.4 show the change in employment by occupation wage quartile from the same quarter in 2019 using the Current Population Survey (CPS; also referred to as the “Household Survey”).¹⁸ For all three sectors in which there were significant layoffs in the spring of 2020—local education, local noneducation, and state education, the lowest wage workers suffered disproportionately; this is especially true in education, where low wage workers suffered the brunt of the early layoffs.

18. The data are sorted into quartiles based on the average wage by occupation in 2019. I use this comparison because there are strong seasonal patterns in state and local employment and the CPS data are not seasonally adjusted.

FIGURE 6.4

Changes in State and Local Employment, by Wage Quartile



Source: Census Bureau 2022; author's calculations.

Note: Percent change in employment relative to same quarter in 2019 by occupation wage quartiles.

But employment declined even for those in the highest wage quartile, and by the beginning of 2021, the employment declines were relatively evenly distributed across the quartiles. This is consistent with the notion that declines in employment in the spring of 2020 consisted of workers who were no longer

needed or could not work remotely being laid off as well as broader layoffs that might have reflected expected budgetary pressures from the widely predicted revenue losses. Scarred by the large revenue losses of the Great Recession and the painful spending cuts they required, state and local governments may have acted more quickly this time.

Evidence from Cross-State Variation

There are three sources of data on state and local government employment by state. The first, on which I rely, is the monthly Current Employment Statistics (CES) data—also known as the establishment survey (Bureau of Labor Statistics 2022a). This is a large survey covering roughly 70 percent of state and local employment. It provides data for four categories of state and local workers—state education, state noneducation, local education, and local noneducation—on a not-seasonally adjusted basis.¹⁹ The literature that I discuss below relies on different data, including the monthly CPS (Census Bureau 2022) and the Quarterly Census of Wages (QCEW; Bureau of Labor Statistics 2022). The CPS is a household survey that does not include as many state and local workers as the CES. The QCEW has comprehensive administrative data on employment—that is, it includes every state and local government—but is only available after a six- to nine-month lag.²⁰ As I discuss below, these data sources can give somewhat different signals, reflecting the different definitions of “employment,” the source of information (employer versus household), and, importantly, the different sample sizes of the surveys.

Using the CES, I compare employment in 2020 and 2021 to employment in the same month in 2019, which I call the “employment gap,” to roughly adjust for seasonal patterns in employment. I compare four time periods: May 2020 (the lowest level of state and local employment in the pandemic), October 2020 (when many state and local economies had largely opened up), March 2021 (right before the vaccines became widely available), and December 2021 (the most recent available data at the time of the analysis).

Table 6.5 summarizes the data. There is a lot of variation across the states, with employment falling sharply in some states but rising or only falling a bit in others. The correlations in employment gaps across time periods and types (state/local, education/noneducation) are reported in Table 6.6. There are three important findings:

1. The reductions in employment in the spring of 2020 are only loosely correlated with the gaps in later time periods, as shown in panel A

19. The data for total state and local employment—that is, not broken down by sector—are also available on a seasonally adjusted basis.

20. The QCEW only captures workers subject to the federal unemployment tax; this excludes elected officials and students on work-study programs who are captured by the CES.

TABLE 6.5

Employment Changes Relative to 2019

	Mean	Standard Deviation	Minimum	Maximum
Local Education				
May 2020	-9.4%	3.3%	-18.7%	-4.4%
Oct 2020	-7.0%	2.9%	-15.7%	-2.5%
Mar 2021	-6.2%	3.0%	-13.7%	-0.7%
Dec 2021	-3.6%	2.5%	-9.3%	1.1%
Local Noneducation				
May 2020	-7.3%	4.7%	-28.2%	-1.3%
Oct 2020	-3.6%	2.7%	-11.2%	3.1%
Mar 2021	-3.6%	3.2%	-14.1%	2.9%
Dec 2021	-3.9%	3.1%	-11.2%	3.3%
State Education				
May 2020	-7.7%	6.8%	-25.3%	8.9%
Oct 2020	-8.3%	4.6%	-18.3%	0.0%
Mar 2021	-8.1%	5.7%	-17.7%	12.5%
Dec 2021	-6.3%	7.4%	-22.9%	11.1%
State Noneducation				
May 2020	-0.7%	2.4%	-8.9%	3.4%
Oct 2020	-0.4%	2.6%	-6.0%	7.0%
Mar 2021	0.1%	2.9%	-6.7%	5.1%
Dec 2021	-2.2%	3.2%	-11.8%	5.9%

Source: Bureau of Labor Statistics 2022a; author's calculations.

Note: This table reports the percent change in employment by sector compared to the same month in 2019.



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of Figure 6.5 for total state and local employment. For example, the correlation coefficient between the local education employment gap in May 2020 and the local education employment gap in October 2020 is just 0.25. The correlation coefficients are somewhat higher for the other sectors but still weak. In other words, state and local governments that laid off a lot of workers in the spring of 2020 are not necessarily those where employment remained low by the fall of 2020.

2. However, the rankings by state in employment gaps are fairly steady after the first wave of layoffs and rehires (panel B of Figure 6.5), with the correlation coefficients in most cases closer to 0.7 or 0.8. That is, states where the level of employment in October 2020 was particularly far below their pre-pandemic level are also states with the largest gaps between pre-pandemic employment and employment in March 2021 and December 2021.

TABLE 6.6

Correlations in Employment Changes across States

A. Correlation within a Sector across Time Periods

	May 2020 and October 2020	May 2020 and March 2021	May 2020 and December 2021	October 2020 and March 2021	October 2020 and December 2021	March 2021 and December 2021
State education	0.42	0.37	0.31	0.78	0.70	0.68
State noneducation	0.52	0.59	0.38	0.83	0.71	0.83
Local education	0.25	0.22	0.17	0.88	0.58	0.72
Local noneducation	0.67	0.64	0.55	0.89	0.77	0.83

B. Correlation within a Time Period across Sectors

	May 2020	October 2020	March 2021	December 2021
State education vs State noneducation	0.21	0.06	0.10	0.15
State education vs Local education	0.30	0.04	0.02	-0.04
State noneducation vs Local noneducation	-0.06	0.01	0.00	-0.01
Local education vs Local noneducation	0.15	0.21	0.27	0.01

Source: Bureau of Labor Statistics 2022a; author's calculations.

Note: The table reports the correlation coefficients for employment declines relative to the same month in 2019 across time periods and sectors.



- There is little correlation across types of employment. That is, changes in local education employment are not very correlated with changes in local noneducation employment, nor are they correlated with changes in state education employment.

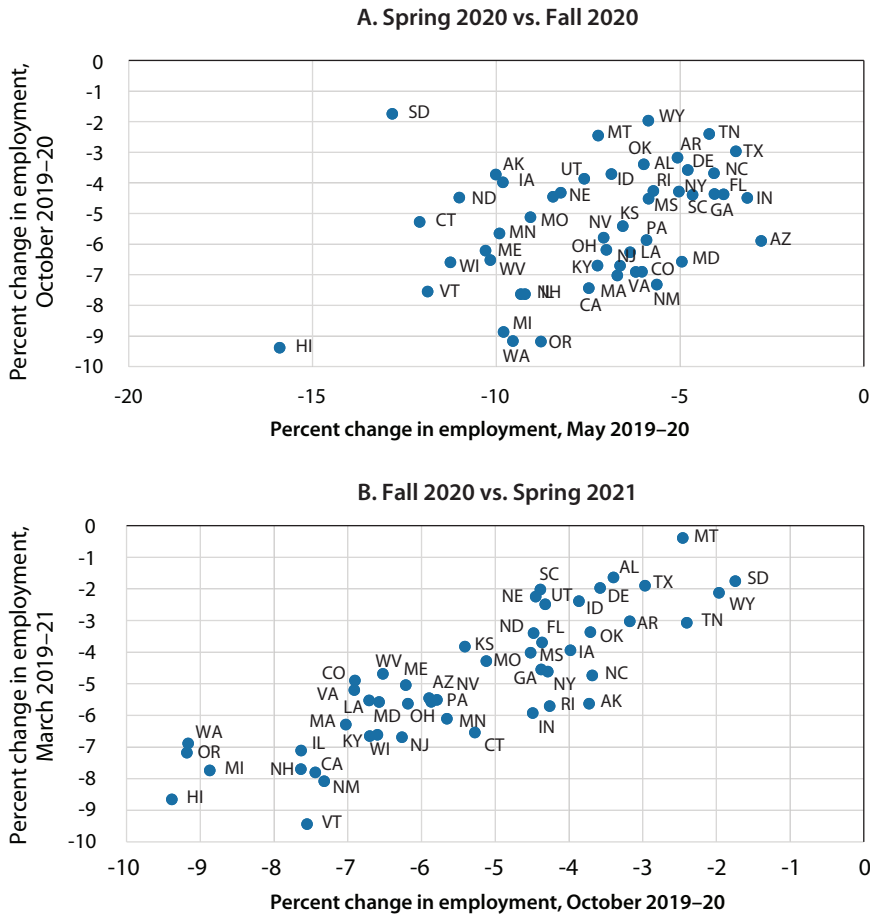
The lack of correlation between employment gaps in the spring of 2020 and later suggests that the first wave of layoffs reflected different factors than those that continue to keep employment levels down. The lack of correlation across types of workers suggests that it will be difficult to find “the story” that explains employment declines at state and local governments.

Understanding Cross-State Variation in Employment Losses

As shown in Online Appendix Table 6.2, many variables that might be expected to predict employment losses in the state and local sector during the pandemic do not. For example, state and local governments that suffered larger revenue

FIGURE 6.5

State and Local Employment Losses over Time



Source: Bureau of Labor Statistics 2022a.

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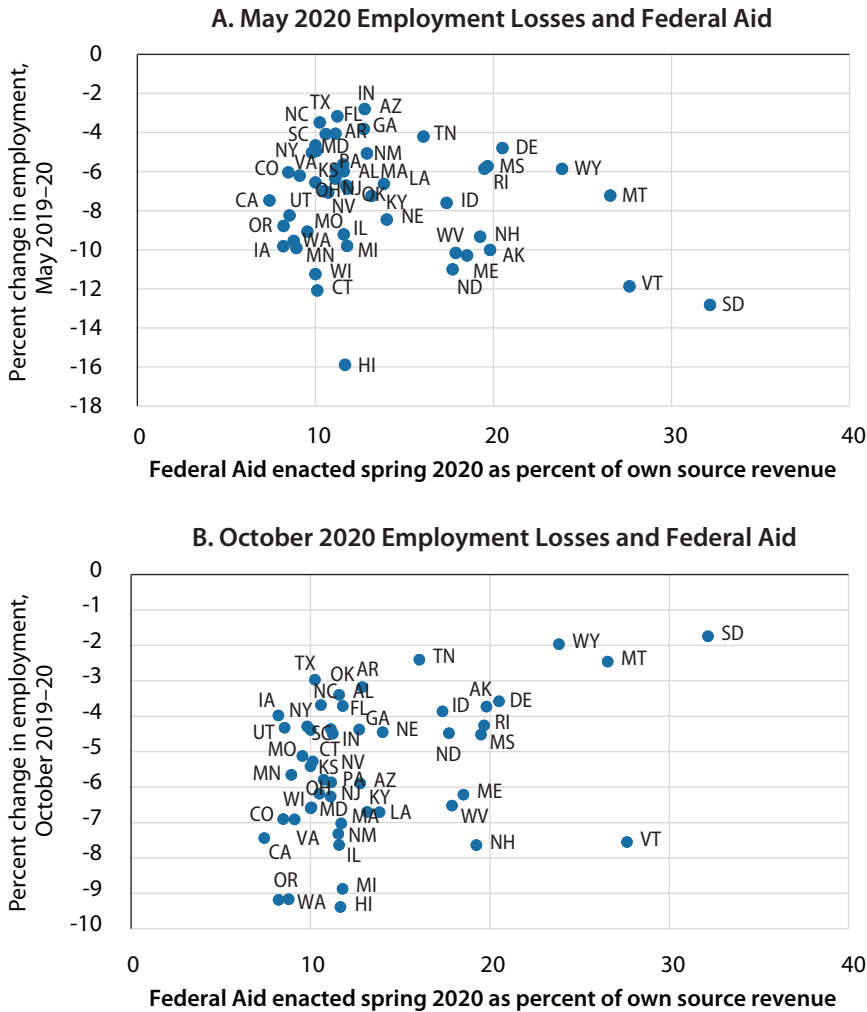


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losses during the Great Recession were not particularly likely to lay off workers during the pandemic, nor were states that predicted large state revenue losses or states that actually experienced larger revenue losses in 2020. Similarly, oil states and tourism states, which did suffer larger revenue losses, did not on average lay off workers disproportionately. States that had large budget balances before the onset of the pandemic did not have smaller employment losses, nor did states that received more federal aid as a share of own source revenues (Figure 6.6).

FIGURE 6.6

Total State and Local Employment Losses and Federal Aid



Source: Bureau of Labor Statistics 2022a; Auerbach et al. 2020.

Two budget-related variables do predict employment gaps in the state and local sector. First, the share of K–12 spending financed by state governments predicts employment gaps in local education, perhaps because localities in these states were more vulnerable to budget cuts coming from state revenue losses.²¹ Second, states that announced hiring freezes at the beginning of the pandemic in response to expected revenue losses had lower levels in state employment outside of education relative to 2019, particularly later in the pandemic.^{22,23}

What about attitudes toward COVID-19? These attitudes affected official decisions about whether offices, schools, and parks were closed or operating at less-than-full capacity, and also affected workers' willingness to work in person and the level of demand for public services during the pandemic. It is well-known that blue states have been much more concerned about the pandemic than red states. The share of voters who chose President Biden tightly correlated with vaccination rates (Online Appendix Figure 6.2) and also with measures such as the Oxford Stringency Index, which captures the degree to which governments shut down economic activity (Hale et al. 2021).

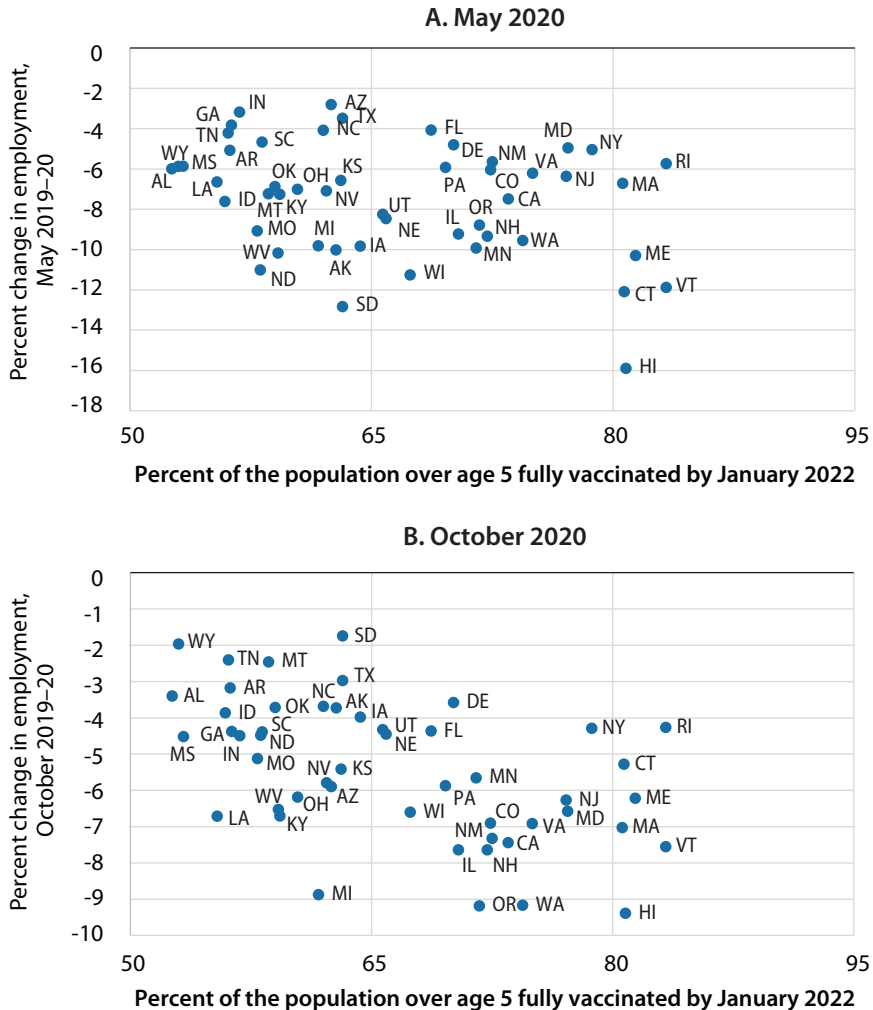
As shown in Figure 6.7, the vaccination rate, measured here as the share of population age five and older fully vaccinated in January 2022, is only loosely related to employment gaps in the state and local sector in May 2020. However, by the fall of 2020 it is strongly predictive of employment gaps: places that ultimately will have high vaccination rates are also those where state and local employment is depressed.²⁴ The time pattern of the relationship makes sense, as attitudes toward COVID-19 were much more similar across the states in the spring of 2020 (e.g., nearly every school system went virtual) than in the fall of 2020 and later (Ferren 2021).

Table 6.7 reports the coefficients from regressions of employment losses relative to 2019 on variables that seem to have some explanatory power. The effects of state financing of education and hiring freezes are as described above. The vaccination rate is strongly predictive of employment gaps in local education and

-
21. Data from the Annual Survey of State Finances (U.S. Census Bureau 2021) shows that aid to local governments increased less in FY 2020 than in FY 2019, perhaps reflecting some cutbacks in aid at the start of the pandemic. It is worth noting that state fiscal years typically begin July 1, but in a number of areas, county and city fiscal years begin later (Gentry 2015).
 22. Twenty states (AK, HI, IN, MD, ME, MI, MO, MN, NH, NJ, NM, NY, NV, OH, PA, TN, VA, WA, WI, WY) announced statewide hiring freezes in the spring of 2020, and many were not lifted until 2021 (with New York's not lifted until September 2021). Most states that instituted hiring freezes exempted positions necessary to protect health and safety while others exempted "essential positions" more broadly. Information on hiring freezes was gathered from the National Association of State Budget Officers and the National Association for Law Placement (2021).
 23. These states did not, on average, experience larger revenue losses.
 24. The Biden share of the vote and the Oxford Stringency Index (measured in the fall of 2020) also predict state and local employment gaps; the Biden share is about equally good as a predictor, while the fit of the Oxford index is a little weaker, perhaps because it does not measure overall attitudes as well (Hale et al. 2021).

FIGURE 6.7

Vaccination Rates and Changes in State and Local Employment



Source: Bureau of Labor Statistics 2022a; Center for Disease Control and Prevention 2021.

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noneducation sectors in the fall of 2020 and the spring of 2021 and of employment gaps in state education in the spring of 2021. But in later months, as vaccinations were rolled out and the blue states opened up, the coefficient on the vaccination rate became smaller and less significant. By December 2021 it no longer had a

TABLE 6.7

Explaining the Cross-State Variation in Employment Declines

	Education				Excluding Education			
	May 2020	Oct. 2020	Mar 2021	Dec. 2021	May 2020	Oct. 2020	Mar. 2021	Dec. 2021
Local Employment								
Vaccination rates, January 2022	-0.04	-0.13***	-0.14***	-0.04	-0.13*	-0.09**	-0.10**	-0.02
State share K–12	-0.08*	-0.06*	-0.08**	-0.06*	0.04	0.03	-0.00	0.02
State Employment								
Vaccination rates, January 2022	0.03	-0.07	-0.17*	-0.09	0.01	0.03	-0.02	0.02
State hiring freeze	0.01	-0.01	-0.01	0.00	-0.01	-0.02**	-0.02**	-0.01
State and Local Employment								
Vaccination rates, January 2022	-0.08*	-0.10***	-0.12***	-0.04				
State share K–12	-0.06*	-0.03	-0.04**	-0.03				
State hiring freeze	-0.01	-0.01	-0.01**	-0.01**				

Source: Bureau of Labor Statistics 2022a; Center for Disease Control and Prevention 2021; Congressional Research Service 2019.

Note: The change in employment is defined as the change in a particular month from the same month in 2019. Vaccination rate is the share of the population 5 years and over who are fully vaccinated in January 2022. Regressions use STATA robust command.



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statistically significant effect on the employment gap. The insignificant effect of the vaccination rate on state noneducation employment may reflect that states that were very concerned about COVID-19 invested more in public health, which could have boosted employment, offsetting the negative effects from office closures and the like. In addition, state government jobs may be more amenable to remote work and thus less affected by attitudes toward COVID-19.

This analysis provides little evidence that weak employment has been driven by tight budget conditions or that federal aid has been an important determinant of employment. To be sure, states that announced hiring freezes did so in expectation of tight fiscal conditions, and these freezes, which did not get lifted until 2021, clearly constrained hiring of state noneducation workers. In addition, the fact that K–12 employment was cut more in states where the state financed a larger share of education expenses also suggests that fears of budget cuts affected employment. Still, the big determinants of fiscal

conditions—revenue losses and federal aid—do not help explain the variation in employment across states.

To some extent, the finding that budget conditions were not important factors behind employment losses seems obviously correct; state and local governments have received abundant aid and yet employment remains lower than it was before the pandemic. But simply examining the relationship between the extent of federal aid and the change in employment may not uncover the causal effects of federal aid on employment. Federal aid was not randomly distributed: small states got much more generous aid relative to their budgets, and aid to K–12 was provided on the basis of need (as measured by Title I funding) so that poorer states got more generous allotments. Each of these factors could confound the analysis. For example, states that got a lot of federal aid were small states, and if for some reason, small states are more likely to have large layoffs, then it appears that generous federal aid is associated with worse outcomes. A similar problem arises if states with few resources were more likely not only to have layoffs but also to get generous K–12 funding.

Other Empirical Evidence

The finding using the CES that budget conditions—revenue declines and federal aid—had little effect on employment is contradicted by two papers in the literature that attempt to carefully identify the causal effects of tight budgets.²⁵

Relying on the CPS to measure state and local layoffs, Green and Loualiche (2021) use two strategies to show that a large proportion of the decline in employment in the state and local sector in the spring of 2020 was attributable to tight budgets. First, they argue that states that depended on sales taxes as an important source of financing expected larger revenue losses and show that these states cut employment more. They calculate that sales tax exposure can explain over 660,000 of the state and local jobs lost in April 2020, or about two-thirds of the total decline. In addition, they exploit the kink in the CARES Act formula for aid to show that states that got more CARES funding had lower employment losses, finding that the CARES Act prevented the loss of 400,000 jobs. They also find that these effects are larger for states with smaller rainy day funds.

In the online appendix, I reevaluate the findings in Green and Loualiche. In particular, I compare the results using the CPS used by Green and Loualiche to results using measures of employment changes from the establishment survey (used above) and the QCEW. I show that the results in the Green and Loualiche paper do not hold using the establishment data or the QCEW data,

25. In addition, Sheiner (2020) showed that states that got more federal aid and states that had larger predicted revenue losses suffered larger declines in local education employment. However, the CES data have been revised since then, and these variables no longer predict the revised measures of employment losses by state.

which are almost a complete census of state and local workers. Using these alternative—and much more representative—data, there is no relationship between state and local employment declines and the reliance on sales taxes or the generosity of CARES Act funding (Online Appendix tables 6.3 and 6.4). The increases in layoffs and the declines in employment across states in the CPS have little relationship to the declines in employment as measured by the other two surveys, likely because the CPS sample sizes are too small for reliable cross-state analysis.²⁶

Haughwout, Hyman, and Shachar (2021) used the kink in CARES Act funding to counties—only counties with population greater than 500,000 were eligible for direct aid—to explore the effects of federal aid on employment. Using the QCEW to measure state and local employment, they found that direct CARES Act funding led local governments to recall about 25 percent more education workers in the first two months after the law was passed and that the effect persisted into the fall for governments with good credit ratings. However, only \$28 billion of the CARES Act funds went directly to counties, with the remaining \$132 billion going to states, territories, and tribal governments. Furthermore, states where counties got money directly did not get more money overall: the amount provided to counties was subtracted from the overall allocation, suggesting that the direct targeting of counties mattered for employment.

Overall, it seems clear that the employment losses vary a lot by state in ways that cannot fully be explained. Employment gaps—the differences between employment during the pandemic and in 2019—were clearly affected by attitudes toward COVID-19, and there is some evidence that fears of tight fiscal conditions and direct federal aid to counties affected employment, but generous federal aid to states was clearly not sufficient to reverse or prevent all the employment losses. One important question is, why not? What did state and local governments do with the federal aid, and why didn't they use it to increase employment?

What Has Happened to Spending by State and Local Governments?

Information on spending by state and local governments during the pandemic is sparse. The Census Bureau's Annual Survey of State Government Finances for fiscal year 2020, which includes the first quarter of the pandemic for most states, was released in December 2021. No data are yet available for either FY 2020 spending by local governments or for FY 2021 for either state or local governments. The National Association of State Budget Officers (NASBO) publishes

26. The total number of state and local workers captured in the CPS in April 2020 was about 6,000, of whom 572 were unemployed. The median number of unemployed state and local workers in a state was just nine.

an annual report on state government expenditures, the latest of which includes estimates for FY 2021. However, differences in accounting practices across the states can make that report somewhat difficult to interpret, as I explain below.

Information for Fiscal Year 2020

According to the Census Bureau's Annual Survey of State Finances, expenditures by state governments increased 7.6 percent in 2020, up sharply from the 4.3 percent increase in 2019 (Online Appendix Table 6.5). However, most of that increase reflects larger expenditures on insurance benefits, consisting mostly of UI benefits. These expenditures are not subject to balanced budget requirements, and states can adjust to the shock gradually over many years.²⁷ Excluding such expenditures, state expenditures increased 4.7 percent—roughly the same as the 4.5 percent increase in 2019. The categories of spending did show marked differences, however. Growth in spending on corrections, police protection, health, hospitals, and public welfare picked up from 2019 while spending on parks and recreation, natural resources, highways, governmental administration, and education increased at a slower pace than in 2019. The savings that states realized from shutting down schools, offices, and parks likely allowed for increased spending elsewhere.

Information for Fiscal Year 2021

Table 6.8 presents the data from NASBO for both FY 2020 and FY 2021. Overall spending increased 8.7 percent in FY 2020 and 16.2 percent in FY 2021 according to their data—the highest reading in the 35-year history of the NASBO report. Spending financed by the federal government increased 21 percent in FY 2020 and 36 percent in FY 2021. One difficulty with the NASBO data is the inconsistent accounting for UI benefits across states: according to NASBO, some states include only administrative costs associated with UI in their accounting, while others include benefits costs as well, but they do not report which method they use, nor is it clear whether they include all UI benefits or just the regular benefits financed by states (Brian Sigriz, email communication, December 2, 2022).²⁸ UI expenditures, to the extent they are included, are in the “all other” category. Excluding this category of spending, spending increased 4.6 percent in FY 2020—similar to the Census data—and 10 percent in FY 2021. Even accounting for the higher inflation in FY 2021, this is a rapid pace of increase. Furthermore, many other types of pandemic-related expenditures are included

27. Regular UI benefits are financed by states but paid out of a UI trust fund. When benefits exceed available resources, states get automatic loans from the federal government. Following the Great Recession, states in aggregate eliminated their UI debt very slowly, only extinguishing it in 2019 (Auerbach et al. 2020).

28. Brian Sigriz is the director of state fiscal studies at NASBO.

TABLE 6.8

Increase in State Spending, by Source of Funds and Category, FY2020 and FY2021

Source of Financing	Total	General Revenues	Other State Revenues	Federal Funds	Bond Issuance
Fiscal Year 2020					
K–12 education	4.3%	4.9%	0.7%	7.8%	44.8%
Higher education	1.3%	3.4%	2.6%	13.8%	5.4%
Public assistance	-8.0%	3.4%	-17.5%	9.1%	
Medicaid	6.5%	1.3%	-1.3%	10.0%	
Corrections	1.7%	0.3%	13.5%	261.6%	54.0%
Transportation	6.0%	-6.9%	3.1%	6.4%	-0.4%
All other (includes UI benefits in some states)	18.9%	4.9%	5.1%	61.5%	0.5%
Total excluding other	4.6%	2.9%	1.7%	9.9%	7.8%
Total	8.7%	3.4%	3.1%	20.5%	4.7%
Fiscal Year 2021					
K–12 education	28.5%	3.2%	19.0%	83.9%	46.4%
Higher education	4.0%	4.1%	0.5%	11.7%	-3.2%
Public assistance	26.8%	15.6%	35.4%	28.5%	
Medicaid	11.7%	0.1%	12.2%	15.8%	
Corrections	0.2%	-7.3%	-1.5%	171.4%	-42.7%
Transportation	8.5%	38.8%	4.2%	13.1%	17.4%
All other (includes UI benefits in some states)	29.4%	8.5%	12.3%	73.0%	13.4%
Total excluding other	10.1%	2.3%	5.3%	21.4%	7.9%
Total	16.2%	4.1%	8.3%	35.7%	10.1%

Source: National Association of State Budget Officers (NASBO) 2021.

Note: The table reports the annual percentage increase in state spending in fiscal years 2020 and 2021.



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in “all other,” including spending on public health, housing assistance, economic relief, aid to local governments, and broadband and other technology upgrades, so excluding the category will understate the true increase in state spending in response to COVID-19.

Thus, according to the NASBO (2021) data, state spending in 2021 was quite robust, even though employment remained weak, and it appears that states

are spending the federal aid at a relatively quick pace.²⁹ Nonetheless, states budget conditions remain very healthy, with total balances (rainy day funds plus general budget surpluses) reaching a record 23.3 percent of expenditures at the end of FY 2021. Furthermore, more than \$100 billion in aid has yet to be distributed (Parlapiano, Solomon, Ngo, and Cowley 2022).

State and local spending in the National Income and Product Accounts (NIPA; Bureau of Economic Analysis 2021a and 2021b) looks quite different from the state spending reported in the NASBO State Expenditure Report: in the NIPA, nominal state and local expenditures rose 3.3 percent in FY 2020 and just 3.7 percent in FY 2021.³⁰ Nominal state and local purchases—the part of state and local spending that enters directly into GDP—rose 3.2 percent in FY 2020 and 2.5 percent in FY 2021. But the data on which the purchase estimates are based are quite sparse: They include data on employee compensation (which comes from data on employment and wages), construction (which comes from monthly Census surveys), and motor vehicle purchases (from R. L. Polk and Company). Most other expenditure categories are estimated from historical trends.³¹ Given the strength of the NASBO data, it seems likely that the BEA has underestimated state and local purchases in FY 2021 and thus overstated the drag of the state and local sector on the macroeconomy. Of course, not all the increase in spending represents state and local purchases. As Table 6.8 shows, state spending on public aid increased sharply and this spending is not included in NIPA purchases—so the eventual revisions to GDP, which will occur during the annual revisions after BEA has the data from the Census, are difficult to predict.

Why Haven't State and Local Governments Used Federal Aid to Increase Employment or at Least Return It to Pre-Pandemic Levels?

It is hard to understand why employment in the state and local sector remains depressed given the rollout of vaccines; the reopening of parks, schools, and offices; and the healthy state budgets. In this section, I discuss several possible

29. Federally funded state expenditures were \$473 billion higher than implied by a baseline where federal grants increased four percent per year from 2019 on. Excluding the “all other” category that contains at least some federally paid UI benefits, the increase in federally financed expenditures is \$163 billion. Of the roughly \$1 trillion in funds, about \$350 billion went directly to states.

30. In the NIPA, all UI benefits are deemed federal spending, so they are not included in these numbers. “FY 2020” is defined here as 2019Q3 through 2020Q2.

31. For total expenditures, as opposed to purchases, the Bureau of Economic Analysis also has access to administrative data on Medicaid spending and some other social programs (U.S. Bureau of Economic Analysis 2021).

reasons. These are based on conversations with state officials and anecdotes rather than on hard data.

One narrative that I have heard repeatedly is that “a rule of budgeting is not to use one-time money for permanent expenses.” Thus, decisionmakers are loathe to use federal aid on services for which there might be continued demand after the federal money runs out. For example, one school superintendent explained that he would not want to reduce class sizes using federal aid—even if that might be particularly effective at remediating learning losses from virtual schooling—because there would be continued demand for smaller classes after the federal aid ran out. Instead, schools were looking for one-time expenditures (e.g., new equipment or HVAC systems) to fund with the federal aid. A counterargument is that many states are eyeing tax cuts, which similarly hold down revenues and worsen budget conditions over the long run.

To the extent that layoffs in the spring of 2020 were caused by the fear of tight budget conditions, the restrictions on the use of the CARES Act funds (i.e., the prohibition on using them for expenses that were budgeted for before the COVID-19 pandemic) may have limited their effectiveness at minimizing layoffs. Similarly, the funneling of most of the aid money through the states—rather than directing a significant portion to local governments—may have meant the money was too slow to get to local governments.

When employers wanted to resume hiring, they faced an extremely tight labor market. As shown in Figure 6.2, job openings have been elevated since the second quarter of 2021, but hiring has not increased much, and as shown in Figure 6.3, wages of state and local government workers have not kept pace with raises in the private sector. This lack of pay parity likely exacerbated hiring difficulties associated with the difficulties faced by many state and local workers during the pandemic. School workers, for example, have had to deal with risks of COVID-19 exposure, hybrid teaching, school closures, and staff shortages. With the state and local workforce largely unionized, it is difficult to provide higher pay to attract new employees without having to increase pay all around. And again, state and local governments are wary of increasing pay because of the implications for future years when federal money is no longer available.

Another possibility that several state officials mentioned is that the pandemic has improved the efficiency of the public sector. Whether it was laying off workers whose services were not highly valued or the increased efficiency from remote work and videoconferencing, government officials may not think they need as many workers as they did before the pandemic. State noneducation employment fell during the Great Recession and never fully recovered, suggesting that some of the declines in employment may be long lasting.

Finally, changes that occurred during the pandemic may have increased the uncertainty about future spending needs and revenues. For example, given the strains on the public health system during the pandemic, state and local governments may want to increase investments going forward to prepare for future health emergencies (Bosman and Fausset 2020). In addition, the transition

to remote work leaves many cities unsure about whether economic activity will return to pre-pandemic levels anytime soon, putting revenues from taxes and fees at risk and also leading them to perhaps fundamentally rethink their transportation and transit infrastructure. This type of uncertainty may have led state and local governments to be very cautious in committing funds too rapidly.

Lessons Learned

Seven lessons can be learned from the experiences during the pandemic.

1. Policies that provide fiscal support to households and businesses indirectly support state and local revenues. When contemplating the amount of direct aid that might be necessary, these policies should be taken into account.
2. To prevent layoffs and ensure adequate public service provision, aid to state and local governments should be automatic or should be provided early in a recession. While most of the employment declines in the state and local sector over the past two years are likely related to pandemic-specific factors, there is evidence that some of the employment losses reflected fear of tight budget conditions. At a minimum, the states that imposed hiring freezes would likely not have taken that step had they anticipated the substantial federal aid that would be forthcoming. While not definitive, the experience during the pandemic suggests that preventing initial layoffs is important.
3. Federal aid should go directly to states and localities instead of only to state governments, where possible, and should have few conditions placed on it. Although money is fungible, the way aid is distributed does matter. The fact that states were explicitly prohibited from using CARES Act funding to cover revenue losses and the targeting of aid to states and only very large substate governments may have made it less effective at preventing layoffs. The \$350 billion in federal aid in the ARP was much better on this front. It provided aid directly to local governments, thus bypassing the possibly slow process by which states redistribute aid to local governments, and allowed a much broader array of purposes.
4. State and local governments are reticent about using one-time federal aid to finance ongoing expenditures. That might preclude aid from being used for the most effective purposes (e.g., increasing teaching resources to address learning losses during the pandemic).

5. The ability of state and local governments to borrow from the Fed can serve as an important backstop that can help stabilize municipal bond markets in times of crisis.
6. More timely data on state and local governments are needed. In 2020 the Bureau of Economic Analysis relied on the Urban Institute's collection of data from state agencies because these were available before the Census Bureau's Quarterly Summary of State and Local Taxes. Similarly, NASBO published data for state spending in FY 2021 over a year before the Census will release such data. Unfortunately, there are no nongovernmental sources for data on spending by local governments, and government data will not be released for FY 2020 (meaning through 2020Q2) until June 2022. The lack of timely official data made it difficult to assess the fiscal conditions of state and local governments and to know whether the enacted policies were successful. Lack of timely data has also made it difficult to accurately assess the state of the economy because the BEA has such limited information on purchases by state and local governments.
7. This pandemic was different from most recessions. The fact that revenue losses were modest and short-lived, and employment declined despite healthy budgets, does not suggest that aid to state and local governments is ineffective or unnecessary in economic downturns. The lesson of the Great Recession—that inadequate aid to state and local governments can hamper an economic recovery—should not be discarded because of the recent experience; the pandemic created unusual economic conditions that are not likely to recur in future recessions.

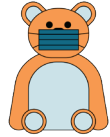
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Lessons Learned from the COVID-19 Policy Response and Child Well-Being

Anna Aizer and Claudia Persico¹

Negative shocks during childhood can have outsized effects because they interrupt a child's healthy growth and development (Almond, Currie, and Duque 2018); even transitory events in childhood have been shown to have long-term consequences. With a growing portion of children's lives spent during the COVID-19 recession and recovery, the pandemic may end up affecting the lives of children the most.

Some negative shocks experienced by children were specific to the pandemic and may not recur in the next recession, including the closing of schools and child-care facilities and the loss of parents, family, and other caregivers. These shocks increased stress and affected the social and emotional well-being of students and adult caregivers. Lake and Gross (2021) find that 30 to 40 percent of young people ages 13 to 19 have likely experienced negative impacts to their mental health as a result of the pandemic. Rates of anxiety and suicide attempts increased among students. The negative effects were most pronounced for students who learned remotely for long periods of time, girls, and students from historically marginalized groups. Lake and Gross further find that the negative effects of the pandemic increased over time and that student supports were often inadequate.

Other negative shocks—loss of household income, food insecurity, disruptions in health insurance or child care, and reductions in school spending—are common across recessions. A large body of research links income, health insurance, food security, access to high quality child care, and school spending to child health and school achievement outcomes. While researchers will not know the full impact of the pandemic and the policy response on child outcomes

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for many years, existing research on the impact of negative shocks to children and evidence on the short-term impact of various policies enacted during the pandemic allow for reasonable projections and policy lessons for protecting children from the consequences of a more typical downturn.

Pandemic-specific shocks to healthy child development, such as the closing of schools, COVID-related disability and the loss of family members, will have negative impacts on children's well-being but are not the focus of this chapter. Our main objective is to provide lessons to policymakers who seek to lessen the negative impact of the next recession on children and families. In what follows, we focus on the following policy domains: income, education, child care, health insurance, and food and nutrition.

Income

The decline in earned income at the beginning of the pandemic was unprecedented. The employment rate among all individuals 16 and older fell from 60 to 52 percent in April 2020; between late March and June, over 50 million claims were filed for unemployment insurance (Han, Meyer, and Sullivan 2020). While employment has since increased, as of January 2022, it remained slightly below pre-pandemic levels (Bureau of Labor Statistics 2022). Some portion of this job loss may not be cyclical, and likely reflects school and child-care facilities closures (see Box 7.1).

Parental job loss leads to temporary declines in family income, but for some, the loss of income persists (Oreopolous et al. 2005). Parental income has been shown to have a causal impact on child health and educational attainment (Case et al. 2002; Akee et al. 2010; Aizer et al. 2016; Hoynes, Schanzenbach, and Almond 2016). This has long-term consequences: parental job loss and the accompanying decline in family income during childhood have been linked with significant reductions in offspring earnings in adulthood and increased reliance on public support (Oreopolous et al. 2005).

Government transfers are one way to replace lost wage income. Indeed, generous income assistance during the first year-and-a-half of the pandemic was provided via extensive cash and near-cash transfers to households. These transfers benefited families with children through targeting children and, indirectly, by targeting workers with shorter or intermittent job tenure as well as part-time workers, who are disproportionately female and therefore more likely to live with children. It is important to note that many immigrant families, who were disproportionately affected by the pandemic by virtue of their high representation in service industries, did not benefit from these measures.

During the pandemic, the traditional Unemployment Insurance (UI) program was expanded to extend eligibility for UI benefits to groups not usually covered—including the self-employed, part-time workers, and those with short work histories—through the Pandemic Unemployment Assistance program, and intermittently to provide an extra \$600 or \$300 supplemental weekly UI

BOX 7.1

Evidence of the Relationship between School Closures and Labor Supply

Reduced school days and virtual school may have caused parents to stay out of the labor force or reduce their hours to care for their children. The evidence on the extent to which increased child-care demands explain the drop in labor force participation among women is mixed. Aaronson and Alba (2021) show that women's labor force participation dropped precipitously in March 2020. However, they find that factors such as school closures and virtual schooling had only a modest impact on the labor force participation rate of women and conclude that other factors such as women's predominance in service-oriented occupations must be at play.

Bauer et al. (2021) find that mothers of children ages 5–12 years saw a greater decline in employment than mothers with older children, and Hansen, Sabia, and Schaller (2022) find that the recent school reopenings have been associated with significantly increased employment and hours among married women with children in kindergarten through grade 12 (K-12). Garcia and Cowan (2022) find little effect of child-care and school closures on labor force participation but do find that parents reduced the number of hours they worked. Tedeschi (2020) also finds that school closures reduced women's labor force participation. On the other hand, Furman et al. (2021) find that nearly all of the aggregate, ongoing employment deficit among mothers is explained by factors that affect workers more broadly rather than challenges specific to working parents.

Overall, the evidence seems to suggest multiple factors (not just school closings) disproportionately affected women's labor supply and that a relevant margin is the intensive one—reduced hours of work.

benefit. These expanded UI benefits were not extended to anyone without proper work authorization, thereby excluding families with undocumented workers.

In addition, there were three rounds of Economic Impact Payments (EIPs), all of which increased payments with the number of children in the household. The first round provided \$1,200 to single head of households with income below \$112,500 and \$2,400 to married couples with income less than \$150,000, with an additional \$500 for each qualifying child.² The second round cut the initial payment in half but increased the incremental benefit based on the number of children to \$600 per child, and the third round increased the initial payment and each additional payment per child to \$1,400. Some, but not all, immigrant families were eligible for these funds.³

2. The threshold was \$75,000 for single filers.

3. Children of undocumented parents were not eligible for any of the EIPs. For the children of immigrant families, the first EIP required all adults to have a valid social security number

Finally, the American Rescue Plan Act (ARP) increased the Child Tax Credit (CTC) from \$2,000 to \$3,600 per child under 6 and to \$3,000 per child aged 6–17 and made the credit fully refundable, but only for 2021. In addition to these income transfers, pandemic relief also included increases in near-cash transfers through the Supplemental Nutrition Assistance Program (SNAP, formerly known as the Food Stamp Program) and the Pandemic Electronic Benefit Transfer (Pandemic EBT) program to purchase groceries. The latter provided a debit card to families with children to be used to purchase food in lieu of meals missed because of school closings.

When both near-cash transfers and cash transfers are included in an income measure, as in the Supplemental Poverty Measure (SPM), the effects of fiscal support can be seen to more than mitigate the impact of the pandemic on child poverty. In contrast the official child poverty (OPM) rate (calculated based on pretax income and cash transfers including UI but excluding refundable tax credits) rose during the pandemic from 15.5 percent in 2019 to 16.1 percent in 2020 (Figure 7.1). However, once government transfers (e.g., EIPs, SNAP, the National School Lunch Program, and the Special Supplemental Nutrition Program for Women, Infants, and Children [WIC]) and tax credits (the Earned Income Tax Credit [EITC] and CTC) are accounted for via the SPM, child poverty fell from 12.6 percent in 2019 to 9.7 percent in 2020 (Fox and Burns 2021).⁴

This decline was greater than the decline in the adult SPM, which fell from 11.2 to 8.8 percent over the same period. This experience contrasts somewhat with the trends in child poverty after the Great Recession, when the SPM for children held steady but did not decline. For children, the most important factors keeping them out of poverty in 2020 (in order) are the EIPs, refundable tax credits (EITCs and CTCs), UI, and SNAP.⁵ Temporary Assistance for Needy Families and WIC played only small roles (see Box 7.2 for a detailed comparison of the OPM and SPM).

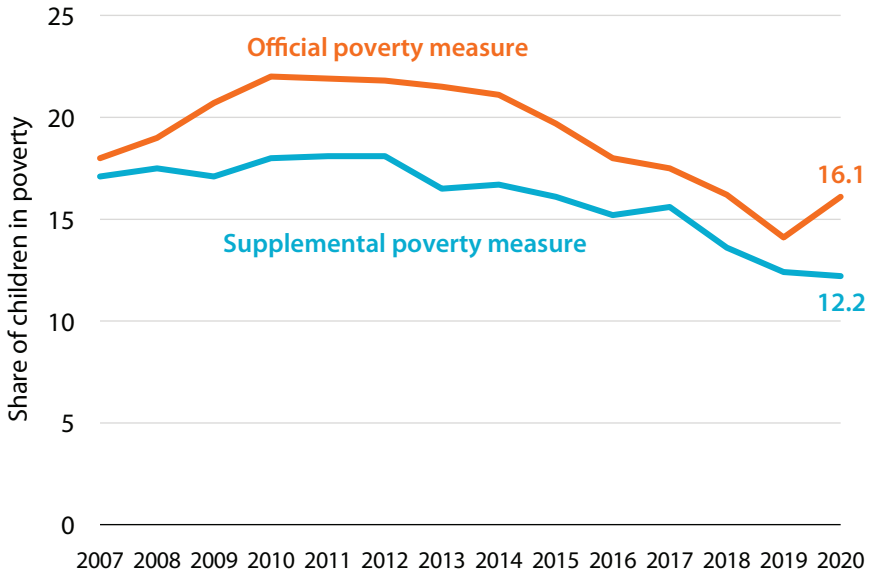
These government transfers reduced financial hardship for families with children: the share of families with children facing food insecurity, difficulty

(SSN), excluding all mixed status households. The second round of payments included mixed status households, but at least one adult needed a valid SSN not just an individual taxpayer identification number (ITIN) and work authorization. The third stimulus allowed for dependents of ITIN-filers to claim the payment if they had valid social security numbers. Children with a valid SSN were eligible for the expanded CTC if their parents had a valid SSN or ITIN.

4. These reductions in measured poverty, based on the Annual Social and Economic Supplement (ASEC) of the Current Population Survey (CPS), likely understate the true impact of federal pandemic relief on child poverty. While the Census imputes EIPs in the CPS so that they roughly match actual payments (Bee et al. 2021), no such adjustments are made for SNAP and UI benefits, which were significantly underreported in these data, a long-standing problem made worse by the pandemic. In particular, total UI benefits reported in the 2020 are just 40 percent of the total actually paid out, and total SNAP benefits are 44 percent.
5. The programs keeping adults out of poverty in 2020 are (in order) Social Security, Economic Impact Payments, UI, and tax credits.

FIGURE 7.1

Poverty Rate for Children 0–18, Official and Supplemental Measures



Source: Columbia University Center on Poverty and Social Policy 2021; Current Population Survey Annual Social and Economic Supplement n.d.

Note: For additional details, see Box 7.2 of this chapter.

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paying usual household expenses, or difficulty paying rent or mortgage was lower than would have been expected given economic conditions (Cooney and Shaefer 2021). Despite very high unemployment rates, reported hardship was largely stable during the first few months of the pandemic, though it began rising again in late fall 2020 as the economy stalled and the benefits of the first set of transfers began to fade. Cooney and Shaefer (2021) report that between November and December 2020, the share of families with children who found it “very difficult to pay for usual household expenses” increased from about 19 percent of all families with children to 23.1 percent. However, after December 2020, when Congress provided another round of EIPs and increased SNAP benefits under the Consolidated Appropriations Act, that share began to decline, dropping to 19.5 percent of families in March of 2021; following the passage of the ARP, which included the third round of EIPs and an increase in the CTC, it dropped to 13.5 percent by May 2021. This pattern repeats with food insecurity for households with children (18.3 percent in December 2020, falling to 11.3

BOX 7.2

The Official Poverty Measure and the Supplemental Poverty Measure

The Supplemental Poverty Measure (SPM) was developed in 2011 to address some of the shortcomings of the Official Poverty Measure (OPM). First, while the OPM is exclusively based on cash income, the SPM includes in-kind government non-health benefits (e.g., food assistance through SNAP and WIC, and housing subsidies) as well as refundable tax credits such as the EITC. Moreover, the SPM removes nondiscretionary expenses (income and payroll taxes, medical out-of-pocket expenditures, and work expenses) from the income measure, whereas the OPM is based on pretax income. Second, while the poverty thresholds for the OPM are based on the cost of a minimum food diet, the poverty threshold for the SPM is based on expenditures for food, clothing, shelter, and utilities and is adjusted for geographic differences in the cost of living.

With respect to pandemic-related transfers, the OPM accounts for expanded UI benefits, but only the SPM captures the EIPs, increased housing assistance, and the SNAP, CTC, and EITC expansions.

percent by May 2021) and housing hardship (15.7 percent in December 2020, falling to 10.6 percent in May 2021).⁶

The policy response during the pandemic differed from government support during prior recessions in three key respects. First, there were much larger cash transfers to the unemployed, including people with less attachment to the labor force (part-time workers or those with short work histories) who are more likely to be parents. Second, the value of EIPs increased with the number of children in the household and were not conditioned on labor force attachment, thereby reaching children at risk of deep poverty who typically do not benefit from UI during recessions. Third, refundable tax credits became more generous, and these went primarily to households with children (EITC) or only to households with children (CTC). This contrasts with the Great Recession, when relief was both much less substantial and less progressive and did not target children to the same degree; as a result, child poverty, and especially deep poverty, was less responsive to government aid (Moffitt 2013).⁷

6. Housing hardship is defined as a negative response to the question “Is this household currently caught up on rent/mortgage payments?”

7. In the Great Recession, income support was provided mostly through the traditional UI program but also through expansions in EITC, the CTC and SNAP. Annual SNAP spending increased from \$30 billion to \$65 billion, the EITC rose from \$49 to \$59 billion, and UI increased from \$34 to \$142 billion between 2007 and 2010. Congress expanded the CTC in

Child poverty is projected to have fallen further in 2021 due to continued UI benefits, EIPs, SNAP expansions, and, most importantly, the expansion in the CTC to \$3,000 per child (\$3,600 for children under six) and its extension to households with very low or no earnings. The Urban Institute expects that the SPM rate in 2021 will fall to 8.1 percent for adults 18–64 and to 5.6 percent for children; this would represent the first time the child poverty rate has fallen below the rate for adults (Wheaton, Giannarelli, and Dehry 2021). Moreover, the various transfers disproportionately affected Black and Latino children. Their poverty rates in 2021 are projected to be 13 and 12 percent, respectively, much lower than the 22 percent and 21 percent that would have prevailed in the absence of the ARP. For white children, the poverty rate is expected to be 6 percent in 2021, compared to 9 percent in the absence of the ARP (Center on Budget and Policy Priorities 2021).

However, much of this progress appears to have been reversed in early 2022. With employment levels not yet rebounded to pre-pandemic levels, expanded UI benefits largely expired, and with the CTC not extended, early estimates suggest that the poverty rates for children increased from 12.1 percent in December 2021 to 17 percent in January 2022, with disproportionate effects for the most disadvantaged (Figure 7.2).⁸ Indeed, the CTC was estimated to have kept 3.4 million children out of poverty in September 2021 when expanded UI benefits ceased, and in January 2022, after the expanded CTC ended, it was estimated that 3.7 million children fell below the poverty line without the monthly CTC (Bee, Hokayem, and Lin 2021). Given the evidence on the negative effects of poverty on child development, this reversal will increase disparities in child outcomes that will likely result in worse labor market outcomes, health, and well-being in adulthood (National Academies of Sciences, Engineering, and Medicine 2019).

Education and Virtual Schooling

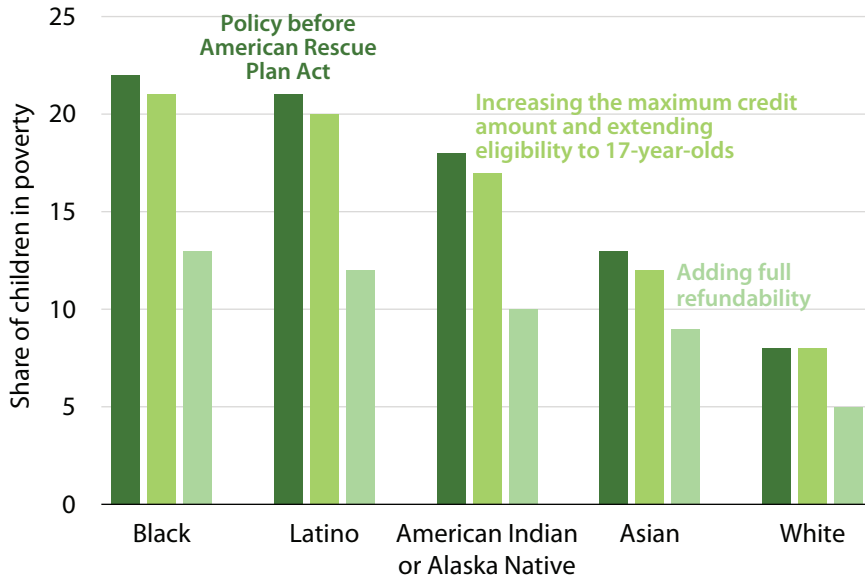
The pandemic led most schools to close nationwide for the final months of the 2019–20 school year, a large number to be closed during the 2020–21 school year, and many schools to close intermittently during the 2021–22 school year. As a result, many students lost more school days than in previous years (West and Lake 2021). Disruptions in education for children can have long-lasting effects. While we hope and expect that the next recession will not coincide with widespread school closures, children’s education can suffer in a typical recession too. Instability in the household affects learning, and due to revenue

2009 by lowering the refundability threshold from \$8,500 to \$3,000, which was extended and eventually made permanent in 2015.

8. The employment-to-population ratio was 59.3 percent as of December 2021, compared with 61.2 percent pre-pandemic. The unemployment rate was 3.9 relative to 3.5 percent pre-pandemic (Bureau of Labor Statistics 2022).

FIGURE 7.2

Effect of Child Tax Credit Policy Changes on Child Poverty, by Race



Source: Center on Budget and Policy Priorities 2021.

Note: All estimates reflect a pre-pandemic economy, using tax year 2021 tax rules and incomes adjusted for inflation to 2021 dollars.

Full refundability means that families with little or no income for the year can receive the full credit. American Indian and Alaska Native (AIAN) children may be AIAN alone or in combination with other races and ethnicities. Other racial/ethnic groups refer to children of that race alone and not Latino. The middle bar shows estimated child poverty rates if the Child Tax Credit were expanded to \$3,600 per child under 6 (\$3,000 per child 6-17) but retained the \$2,500 earned income floor and 15% phase-in rate present under pre-Rescue Plan law but removed the \$1,400 per child cap on refundability.

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losses already sustained or expected in the future, state and local governments generally cut funding for education.

Relative to previous recessions, the federal government provided much more financial assistance both directly to schools and to state and local governments more broadly. Federal funding for schools was increased to support new pandemic-related outlays, including a transition to online learning. The federal government provided nearly \$200 billion in federal aid to state education in three relief packages via the Elementary and Secondary School Emergency Relief Fund (NCSL 2022). Most of the federal funding for schools during the pandemic, including \$122 billion in federal aid to states for K-12 spending

provided through the ARP and \$54 billion through the Coronavirus Response and Relief Supplemental Appropriations Act, was distributed in proportion to Title I funding, which provides supplemental funding to high poverty districts. In addition, about \$750 billion in additional aid was provided to state and local governments (see chapter 6 of this volume).

These outlays far exceeded increased federal funding for schools provided during the Great Recession. The American Recovery and Reinvestment Act (ARRA) of 2009 earmarked \$53.6 billion for education through the state fiscal stabilization fund and \$25.2 billion in K-12 education funding through Title I and the Individuals with Disabilities Education Act (U.S. Department of Education 2009). The ARRA also provided other aid to states to help stabilize state budgets and meet other needs, primarily through an increase of 6.2 percentage points in the federal share of Medicaid expenditures (the Federal Medical Assistance Percentage or FMAP). Despite the greater support that states received since early 2020, it turned out that state revenue losses during the pandemic were much more muted and temporary than during the Great Recession.

However, although the level of federal support has been considerably higher, there have still been gaps and shortfalls. Despite the large overall size of the federal aid, Gordon and Reber (2021) estimate that in a baseline scenario, only 62 percent of districts, and 95 percent of high poverty districts (defined as a poverty rate in excess of 25 percent), have received enough Elementary and Secondary School Emergency Relief Fund aid to cover fully the costs associated with COVID-19, including costs expected to be incurred in the years ahead to address learning losses.⁹ While acknowledging significant uncertainty, they estimate that 85 percent of lower-poverty districts (defined as a poverty rate below 10 percent) are expected to face an increase in budgetary shortfalls of more than \$200 per student for four years, with some districts experiencing budgetary shortfalls larger than that. In addition, the decline of employment in the K-12 sector has been stark—and much larger and faster than in the Great Recession (Aldeman 2021).¹⁰

In the wake of more typical recessions, cuts to state and local school funding can be severe, persist for years after the recession ends, and negatively affect student outcomes. When revenues fall, local governments often struggle to compensate as their revenue is dependent both on state funding and on another somewhat procyclical source: property taxes. During and after the Great Recession, state K-12 funding fell between 2008 and 2010 by \$750 per pupil, with local funding remaining stable until 2010 when it too began to decline, though by a smaller amount (\$200 per pupil). By 2015, nearly seven years after

9. In the baseline scenario they simulate, Gordon and Reber (2021) assume districts have one-time adjustment costs of \$500 per pupil that do not depend on student demographics. They also assume districts must spend an additional \$1,000 per student in poverty and \$500 per student not in poverty per year for four years starting in 2020–21 to address learning loss and other problems created by the disruption to schooling.

10. See chapter 6 of this volume.

the start of the Great Recession, funding had still not returned to 2008 levels, with schools, on average, spending \$400 less per pupil (Leachman, Masterson, and Figueroa 2017). States with lower initial funding levels before the Great Recession had worse outcomes for students during the Great Recession: lower test scores and college attendance (Jackson, Wigger, and Xiong 2021). Spending cuts during the Great Recession increased test score gaps by income and race (Jackson, Wigger, and Xiong 2021).

Conversely, increases in spending on education can positively affect academic achievement, educational attainment, and eventually wages. A 10 percent increase in per-pupil spending each year for all 12 years of public school is estimated to lead to 0.31 more completed years of education, about 7 percent higher wages, and a 3.2 percentage point reduction in the annual incidence of adult poverty (Jackson, Johnson, and Persico 2016).¹¹

Despite the generous federal aid, students' education suffered during the pandemic, and significant resources will be necessary to address the learning losses. Not surprisingly, gains in student test scores in 2020–21 were lower than pre-pandemic trends. As a result, students completed the school year with lower achievement in math (8–12 percentile points) and reading (3–6 percentile points) relative to typical years (Lewis et al. 2021).¹² Dorn et al. (2021) find that students were, on average, five months behind in math and four months behind in reading by the end of the 2021 school year. Halloran et al. (2021) find that passing rates in math and English language arts declined more in districts with less in-person instruction than in districts that were fully in-person.

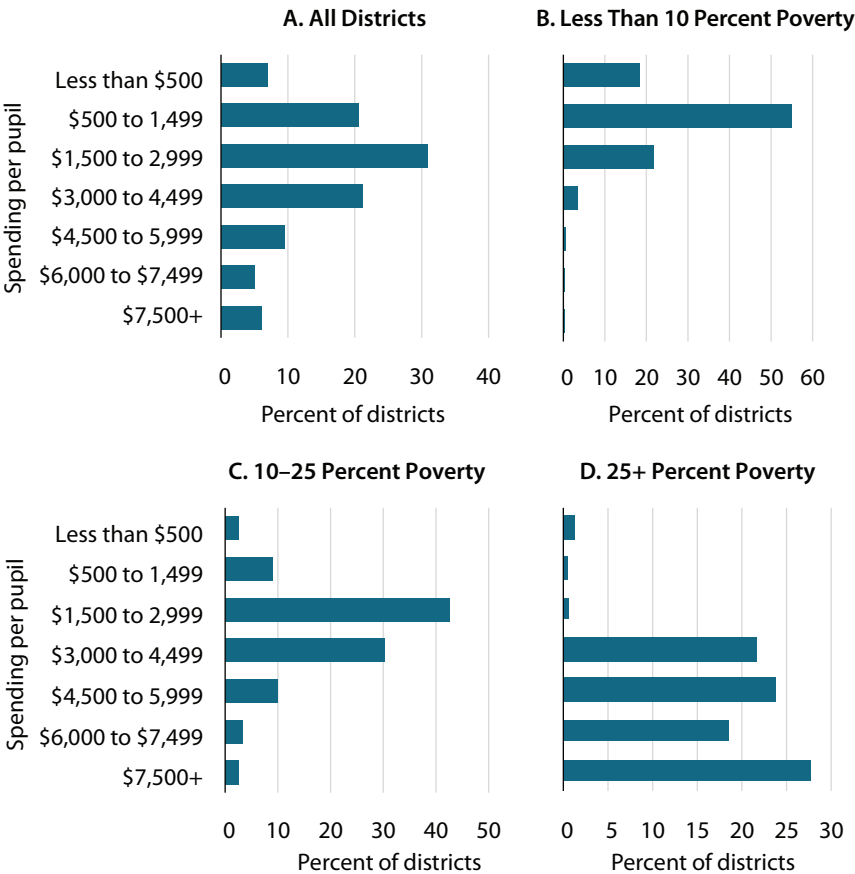
In addition, according to data emerging from states and school districts, fewer students than normal are regularly attending class: reported rates of absenteeism have increased during the pandemic compared with previous years (Carminucci et al. 2021; West et al. 2021). The negative short-term effects of the pandemic on student outcomes are likely to have significant long-term implications with respect to student learning, educational attainment, wages, and health. The closing of schools is likely to be one of the most important legacies of the pandemic.

While some estimates suggest that the direct Elementary and Secondary School Emergency Relief (ESSER) funding to schools to address learning losses was not sufficient (Gordon and Reber 2021), these are based on simulations

11. Other work consistent with this includes Lafortune, Rothstein, and Schanzenbach (2018), who use the timing of school finance reforms to show that post-1990 school finance reforms increased National Assessment of Educational Progress test scores in districts that received more money. Rothstein and Schanzenbach (2021) also find that school finance reforms post-1990 increased high school completion, earnings, and college-going. The results were largest for Black students and women.

12. MAP Growth is a computer adaptive test that is vertically scaled across grades K-12 and measures student achievement in reading and math on the Rasch Unit scale. Using MAP Growth data, researchers converted the data on student test scores to percentile rankings, which were calculated using a pre-pandemic sample of students, so that student achievement could be compared across years.

FIGURE 7.3
Distribution of Per-Pupil ESSER Funding



Source: Gordon and Reber 2021.

Note: Differences in per-pupil ESSER funding are due to differences in child poverty rates across districts.



that assume how much remediation will eventually cost. Moreover, it is not yet clear whether states and local education agencies will make the necessary remediation investments. School systems often do not want to spend one-time federal money on programs for which there will be continued demand after the pandemic (see chapter 6 of this volume), and so they may be unwilling to use the federal money to fund new teachers or other programs that might benefit students in the long run (see Figure 7.3). The ARP stipulates that localities must devote to remediation at least 20 percent of the roughly \$115 billion in

funds in the third round of education funding earmarked for local agencies, but the true cost of needed remediation could be more than this.¹³ Moreover, K-12 employment is still below pre-pandemic levels, so increases in spending may not increase overall resources above and beyond a pre-pandemic baseline.

The federal government's provision of substantial funding to states to compensate for state and local revenue shortfalls likely will reduce cuts in overall education spending and lower geographic and income disparities in funding. But providing state and local governments with large amounts of funding does not guarantee that it will be used in the most efficient way. The federal government should develop guidance for states regarding prudent and sustainable spending that improves student outcomes.¹⁴ This effort would be supported by collecting data on state decisions regarding the amount and allocation of school spending over time to assess the effectiveness of various types of spending in improving child educational outcomes. Federal action might be needed to ensure educational investments in all children across the U.S. return to pre-pandemic levels.

Child Care

Child-care employment falls during most recessions, in part because families in the U.S. are responsible for more than half of spending on early childhood care (Gould and Blair 2020). However, child-care employment fell much more than is typical during the pandemic, declining 32.6 percent from January to April 2020, compared with a 13.1 percent decline in employment overall (Gascon and Werner 2022). In mid-2021 employment in child care was still 6.7 percent below pre-pandemic levels. The closure of child-care facilities has been shown to affect overall unemployment levels (Brown and Herbst 2021); the continued lack of adequate access to quality child care will likely delay returns to pre-recession employment levels.

The federal government provided about \$55 billion in support to child-care centers to help them weather the pandemic.¹⁵ In addition, child-care centers were eligible for grants (in the form of forgivable loans) through the Paycheck Protection Program (PPP). According to the Bipartisan Policy Center, 43,000 child-care providers received \$2.3 billion in PPP funding—representing less

13. In the third round of funding for K-12 education, \$127.7 billion was allocated. Of that, 90 percent is to go to local agencies (representing roughly \$115 billion). The remaining 10 percent goes to states. States are required to allocate 5 percent to remediation (National Conference of State Legislatures 2022).

14. See, for example, Gordon's (2016) policy proposal to increase the targeting, flexibility, and transparency of Title I funding of the Elementary and Secondary Education Act.

15. The CARES Act provided \$3.5 billion, the Coronavirus Response and Relief Supplemental Appropriations Act provided \$10 billion, and the ARP an additional \$42 billion, compared with \$2 billion provided through the ARRA of 2009.

than 7 percent of child-care businesses in the country but about 30 percent of the child-care workforce (Smith et al. 2021). The level of funding provided far exceeds the \$4 billion in funding through Head Start and the Child Care and Development Fund (CCDF) provided during the Great Recession. The child-care center closures observed would likely have been much greater in the absence of this relief.

Most of the pandemic funding was allocated through CCDF, and states were granted significant leeway in how they chose to allocate funds. They could increase subsidy payments to families and/or provide direct grants to child-care providers.¹⁶ Importantly, payments could be based on enrollment rather than on attendance to support stability in the child-care sector. Preliminary evidence as of June 2020 suggests that the funds were being used to pay providers during periods of closure or low attendance and to waive or cover a family's share of child-care costs (Bedrick and Daily 2020).

Despite the overall size of child-care relief provided during the pandemic, many centers closed and their child-care utilization has not fully rebounded. A plurality of families with young children, even more so families of color, were negatively affected by child-care closures (Lee and Parolin 2021; Health Resources and Services Administration 2021; National Public Radio 2021). Measuring child-care visits based on cell phone tracking data, the number of visits is estimated to have declined 60 percent in the first two months of the pandemic, rebounding to a 20 percent deficit by July 2020 and a 12 percent deficit by July 2021 (Cascio 2021; Lee and Parolin 2021; see Figure 7.4). Of the two-thirds of private child-care centers that closed in April 2020, a third remained closed one year later; this contrasts with the experience of Head Start and public preschools, which closed temporarily but eventually reopened.¹⁷

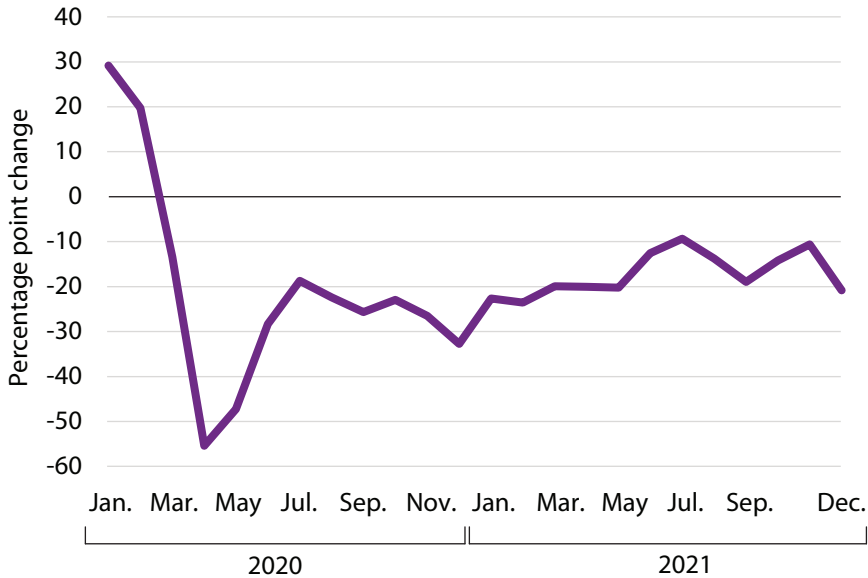
Why wasn't federal funding sufficient to prevent the closure of so many private child-care centers? One likely reason is that the move to work from home and fears of COVID transmission led to a sustained reduction in demand for child care. Another is that most of the additional funding for private child-care centers arrived too late. In a March 2020 survey, nearly a third of child-care providers said they could not survive a closure of more than two weeks without support, 16 percent could not survive longer than a month, and 17 percent said they could not survive any amount of time (National Association for the

16. In total, \$24 billion of the ARP funds were allocated through "stabilization grants." Guidance provided by the ACF to states via CCDF-ACF-IM-2021-02 stated that "providers can spend these funds on a variety of key operating expenses, including wages and benefits, rent and utilities, cleaning and sanitization supplies and services, and many other goods and services necessary to maintain or resume child care services...We encourage lead agencies to award these subgrants simply and flexibly to quickly meet the individual needs of child care providers" (Administration for Children and Families 2021).

17. During the early days of the pandemic, "the vast majority of Head Start programs have temporarily shut their doors due to health risks, but all staff remained employed" and continued to interact with their families at high rates (NHSA 2020).

FIGURE 7.4

Average Change in the Number of Child Care Visits from 2020 through 2021



Source: Parolin and Lee 2021; authors' calculations.



Education of Young Children 2020). The first state-wide lockdowns began in mid-March 2020, but the Coronavirus Aid, Relief, and Economic Security (CARES) Act, which authorized the initial PPP loans, did not become law until March 27; this would have already been too late for nearly half of the child-care centers surveyed (National Association for the Education of Young Children 2020). Considering delays in the application and disbursement process, approximately two in three child-care centers would already have been in significant distress by the time the loan was out the door (Department of the Treasury 2021). Funding specifically geared toward child-care centers (as distinguished from resources through PPP) came even later—enacted only in March 2021 as part of the ARP, after many centers had permanently closed.

However, Head Start and public prekindergarten remained open. The structure of funding differs across public (Head Start and public preschool) and private providers, with significant implications for the providers' financial stability. Public funding for Head Start and public preschool is based on enrollment. As a result, providers have a predictable and stable source of funding

that is not closely tied to actual attendance. In contrast, public subsidies for private care are voucher based, and their funding therefore fluctuates with actual attendance.

While it is difficult to separate the direct impact of the pandemic on the child-care industry from the lack of stable financing, several lessons emerge from the pandemic experience. Federal support to states through CCDF that subsidizes care for low-income families and offers direct grants to providers is crucial for reducing closures. Providing funds to providers through the program based on enrollment, not attendance, would help to stabilize finances during recessions. Moreover, in future recessions, the federal policy response should be immediate to prevent initial closings.

The pandemic experience has made clear that once centers close, additional funding may not be sufficient to resurrect them. Moreover, the closure of private child-care centers appears to disproportionately affect the most disadvantaged families. While Head Start partially offsets the disproportionate impact of these closings, it serves roughly 5 percent of the 20 million children in the U.S. aged four and under and as such cannot completely offset the loss of private providers.¹⁸

Finally, the data on child-care use and availability are poor to nonexistent, making it difficult to monitor and address issues related to child-care access that will almost surely arise in the next recession. This owes in part to the highly decentralized nature of early childhood education in the U.S., which is spread across private providers, public preschools, and Head Start and Early Head Start programs. Developing a means of collecting timely information on the availability and use of early childhood education is necessary to provide policymakers with the tools needed to address and prevent child-care closures in the next recession.

Health Insurance

Because more than half of all Americans receive their health insurance through their employers (Table 7.1), employment losses during recessions can significantly increase the share of individuals without coverage. The loss of health insurance can be especially detrimental to children. Children with health insurance are more likely to receive needed medical care on a timely basis, and child Medicaid coverage has been linked to better health and even greater educational attainment and earnings in adulthood (Currie and Gruber 1996; Brown et al. 2019).

Despite the unprecedented declines in employment during the pandemic, public health insurance did work to offset the accompanying loss in employer-provided

18. Head Start cumulatively served one million children aged zero to five in 2018–2019. Of these, 25 percent were children aged zero to two served in Early Head Start, and the remainder were served in Head Start preschool programs.

TABLE 7.1

Health Insurance Coverage in 2019, by Age

Age	Rates of Health Insurance Coverage		Sources of Health Insurance Coverage		
	Uninsured	Insured	Public	Employer	Individual
0-18	5.7%	94.3%	34.5%	54.9%	5.0%
19-64	12.8%	87.2%	15.1%	64.3%	7.8%
65+	0.8%	99.2%	95.8%	3.0%	0.4%

Source: SHADAC analysis of the 2019 American Community Survey (ACS) Public Use Microdata Sample (PUMS) files.



Note: Respondents are asked about their health insurance coverage at the time of the interview and may select multiple types of coverage; SHADAC assigned one coverage time to each respondent in the following order: 1) Medicare (for people age 19 or older); 2) employer-sponsored insurance (ESI), TRICARE or other military health care, or VA; 3) Medicaid; 4) Individual coverage; and 5) Medicare (for people age 18 or under). Private coverage includes employer (plus TRICARE and VA) and individual coverage. Public coverage includes Medicaid (plus CHIP and state-specific public programs) and Medicare.



health insurance coverage. Medicaid was the most important source of alternative health insurance. Key to the successful transition of families to Medicaid were the Affordable Care Act's (ACA) expansion of Medicaid eligibility to more nonelderly and nondisabled adults, including many parents, and the requirement for continuous coverage that accompanied a temporary increase in the federal contribution to overall Medicaid costs that lower prices.

Largely as a result of the eligibility expansions in the ACA, Medicaid enrollment increased by roughly 10.9 million between 2013 and 2016 (Skopec, Holahan, and Elmendorf 2018). Though eligibility for Medicaid did not expand among children, the increase in Medicaid eligibility among adults had the effect of increasing the number of children enrolled in Medicaid by an additional 710,000 children between 2013 and 2016 via a "welcome mat" effect (Hudson and Moriya 2017). Thus, in contrast to the Great Recession, the current pandemic occurred at a time when many more adults were eligible for Medicaid.

Because Medicaid is funded with a combination of federal and state dollars and is one of the biggest items in state budgets, states often seek to curtail Medicaid outlays by dropping coverage of optional benefits or populations in an effort to reduce expenditures during recessions (Congressional Research Service 2021). At the earliest stages of the pandemic, in March 2020 the federal government moved quickly to reduce barriers to Medicaid enrollment. Swift action was undoubtedly prompted not only by the significant loss in employment and associated coverage but also by the health needs generated by the pandemic.

The federal effort was composed of three main components. The first was to increase FMAP—the share of state Medicaid costs that the federal government covers—by 6.2 percentage points on a temporary basis. This has been used as a policy tool in the past: FMAP was increased during the 2001 recession and the Great Recession of 2009.¹⁹ The second was a reduction in administration hurdles: as a condition of receiving additional federal dollars, states could not (for the period for which FMAP is increased) restrict Medicaid eligibility standards beyond those in place as of January 1, 2020, and they also had to allow for continuous enrollment (i.e., they could not remove people from the Medicaid roles due to changes in income or other such factors or require them to reapply periodically to remain enrolled).

The third component of the federal policy response was to provide additional support to Americans seeking private health insurance coverage to offset the loss of employer-provided insurance. To that end, through the ARP the federal government provided Consolidated Omnibus Budget Reconciliation Act (COBRA) subsidies to Americans who had lost their employer-provided health insurance because of termination or reduction in hours and who sought to continue via COBRA the coverage they previously had through their employer. A 100 percent COBRA subsidy was provided for April to September 2021, and the legislation also allowed for retroactive enrollment. This option was used during the Great Recession as well but at a lower subsidy rate (65 percent).

The federal relief effort to expand access to private insurance for those who may have lost their employer-provided insurance also included efforts to expand access to the ACA exchanges. The ACA exchanges, created after the Great Recession, represented a new mechanism for the government to ensure continuous coverage when families lost their employer-provided coverage. The ARP not only required the exchanges to remain continuously open for new enrollment but also increased the subsidies for those with an income between 100 and 400 percent of the federal poverty level and expanded the subsidies to those above 400 percent of the federal poverty level for 2021 and 2022. Under the ARP, premiums also decreased.²⁰

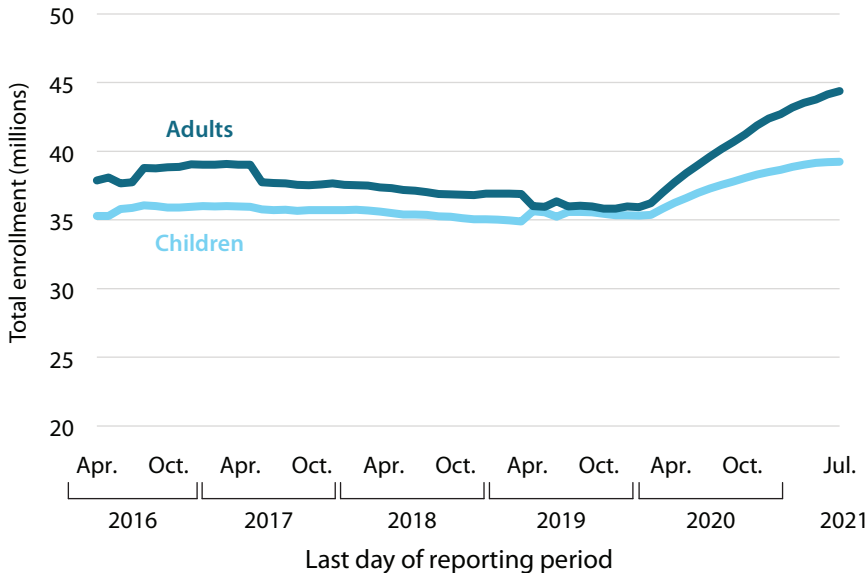
The federal efforts to mitigate the expected loss in health insurance coverage during the pandemic were largely successful. The share of children who are uninsured appears to have increased only slightly during the pandemic, from 5.2 percent in 2019 to 5.6 percent in 2020. Children most likely to lose

19. This was through the Jobs and Growth Tax Relief Reconciliation Act of 2003 and the ARRA of 2009.

20. Under the ARP, premiums were set to zero (for the benchmark Silver plan) for those with income below 150 percent of the federal poverty level and were roughly halved for those between 150 and 400 percent of the federal poverty level. For those with income above 400 percent of the federal poverty level who were ineligible for subsidies before the pandemic, the ARP capped their premium at 8.5 percent of income. The Congressional Budget Office projected total federal outlays associated with these subsidies of \$34 billion (Congressional Budget Office 2021).

FIGURE 7.5

Enrollment in Medicaid and CHIP, January 2016 to July 2021



Source: Kaiser Family Foundation n.d.; authors' calculations.

Note: For data from June 2017 to present, several states have revised their methodology to better align with CMS Eligibility and Enrollment Reports criteria; data reported for May 2017 and earlier months were not updated to reflect this change. These totals exclude states where data were not reported and are subject to change.



insurance over this period were those below the poverty line, Black children, and noncitizens. The increase in uninsurance among children represents two offsetting factors—a 2.1 percentage point decline in the rate of employer-sponsored coverage and a 1.7 percentage point increase in public coverage, with most of this growth from Medicaid (Figure 7.5). A much smaller share of children gained coverage through the ACA exchanges.²¹

Preliminary evidence suggests that rates of uninsurance for children may have fallen in 2021. Data from the National Health Interview Survey, which is not directly comparable to figures based on the Current Population Survey, show a decline in uninsurance rates among children from 5.1 percent of children

21. Overall exchange enrollment increased from 9.7 million in 2019 to 10.6 million in 2020, 12.2 million in 2021, and 14.5 million in 2022, of whom 12 percent were children (Ruhter et al. 2021; Centers for Medicare and Medicaid Services 2021, 2022).

being uninsured in 2020 to 4.4 percent for the first six months of 2021. This decrease was driven by increases in public health insurance coverage, more than offsetting the fall in the share of children with private insurance coverage, from 54.9 percent to 53.1 percent (Cohen et al. 2021).

In sum, despite the unprecedented decline in employment during the pandemic, public health insurance offset the loss of employer-based health coverage. The ACA's expansion of Medicaid and its creation of health insurance marketplaces, and the subsidies to make coverage affordable, played important roles in this, especially since they were strengthened by the requirement for continuous coverage in Medicaid and the increases in ACA subsidy levels.

During the Great Recession, Medicaid played a similarly important role for children but much less so for adults. Between 2009 and 2010, 700,000 children lost employer-provided health insurance coverage, almost fully offset by a 600,000 increase in the number of children with Medicaid. In contrast 500,000 nonelderly adults lost employer-provided health insurance during this time period but only 100,000 gained Medicaid coverage and had no opportunity, of course, to purchase subsidized coverage on an exchange (Holahan and Chen 2011).

Food and Nutrition

Increases in poverty are normally accompanied by increases in food insecurity (Anderson et al. 2012). So, as earned income declines in recessions, food security usually does as well. During the pandemic, in addition to the loss of employment and earned income associated with the recession, the closure of schools interrupted an important source of nutrition for 30 million children, including the undocumented, through the National School Lunch and Breakfast programs.²²

A critical difference in the policy response during the COVID-19 recession and previous ones was the larger amount of direct income assistance. While not specific to purchasing food, this assistance nevertheless contributed to food security. UI, EIPs, and the increased value and full refundability of the CTC increased resources and supported household economic security in 2020 and 2021. In addition to the magnitude of overall income assistance, the support provided immediate income to families that in many cases exceeded pre-pandemic levels. Evidence suggests that families used some of the resources provided through these programs to purchase food, reducing food insecurity (Raifman, Bor, and Venkataramani 2020; Perez-Lopez 2021; Cooney and Shaefer 2021).

The federal government provided additional financial resources to purchase food through SNAP and Pandemic EBT, supported prepared meals that could be accessed in the community, appropriated additional resources for

22. Undocumented individuals and people in the United States on temporary visas are not eligible to receive SNAP or many other forms of government aid.

WIC vouchers, and distributed commodities to food banks to combat food insecurity. Moreover, executive and congressional action reduced administrative burdens to make it easier for families to get and retain access to federal nutrition assistance programs and for states to provide free prepared meals at a wider number of sites and to redirect commodities toward food banks and households.

Federal expenditures on food support increased to \$10 billion a month, on average, in fiscal year 2020, compared with \$7.7 billion a month in fiscal year 2019 (Hodges, Jones, and Tossi 2022). In comparison, during the Great Recession, the ARRA provided \$53.6 billion to help combat food security, significantly less than what was provided during the pandemic (Nord and Prell 2011).

The Families First Coronavirus Response Act increased SNAP spending by allowing every household to receive the maximum benefit for its household size—that is, by eliminating the reduction in benefits that typically occurs as family income increases (typically, SNAP benefits are scaled by family income). Under this policy, more than 5 million children in the lowest income families did not receive any additional SNAP benefits because their families were already eligible for the maximum benefit for their household size. In contrast, during the Great Recession, the SNAP maximum benefit was increased by 13.6 percent through the ARRA, better targeting resources to low-income families with children and reducing hunger among children (Nord and Prell 2021; Hoynes and Schanzenbach 2019).

In 2021, federal nutrition assistance better targeted the lowest income households. The December 2020 relief bill included a 15 percent increase in SNAP's maximum benefit for January through June 2021, and the ARP extended the maximum benefit increase through September 2021. As this benefit increase ended, the summer 2021 annual update to the Thrifty Food Plan, the basis for the establishment of SNAP benefit levels, came into effect. This update increased maximum SNAP benefits by 21 percent, more than offsetting the end of the temporary 15 percent increase in maximum SNAP benefits at the end of September. In addition, the state of Pennsylvania successfully sued to allow SNAP households eligible for the maximum benefit to receive an additional \$95 monthly starting in April 2021 to address continued food insecurity (Pennsylvania Department of Human Services 2022; U.S. Department of Agriculture 2021). Congressional action also reduced administrative burdens to make it easier for families to get and retain access to federal nutrition assistance programs and for states to provide free prepared meals at a wider number of sites and to redirect commodities toward food banks and households.

While prepared meals for children attending school in person remained available, the Pandemic EBT program provided families with a debit card to purchase groceries for children eligible for free or reduced-price meals, including undocumented children, while schools were closed. The program was in some cases slow to roll out because “states had to design and staff a new program infrastructure, as well as create new policy to govern the program”

(Dean et al. 2020). But ultimately, the program “reached a remarkable number of children quickly at a time of great need.” In September 2020, when the program was reauthorized for the 2020–21 school year, it was expanded to needy children 0–5. Early evidence suggests that Pandemic EBT reduced food hardship experienced by children in 2020 and 2021, though implementation delays and administrative hurdles made this program less effective than it otherwise could have been (Bauer, Ruffini, and Schanzenbach 2021; Bauer et al. 2020). Importantly, the Pandemic EBT program reached children with undocumented parents who otherwise would not have been eligible for SNAP or other income support.

On another front, the Farmers to Families Food Box Program authorized the U.S. Department of Agriculture to purchase food from U.S.-based producers to donate them to food banks and other charitable organizations. The CARES Act also included an additional \$400 million for direct food purchases for The Emergency Food Assistance Program, which allows the U.S. Department of Agriculture to purchase food to give to states, which in turn pass it on to food banks for distribution. However, there is evidence that many food banks could not keep pace with demand for food during the pandemic. This is because many food banks depend on retailers’ donations of excess inventory, and many retailers imposed quantity restrictions on food purchases during the pandemic (Bublitz et al. 2020). These interruptions had the potential to significantly exacerbate food insecurity among American children.

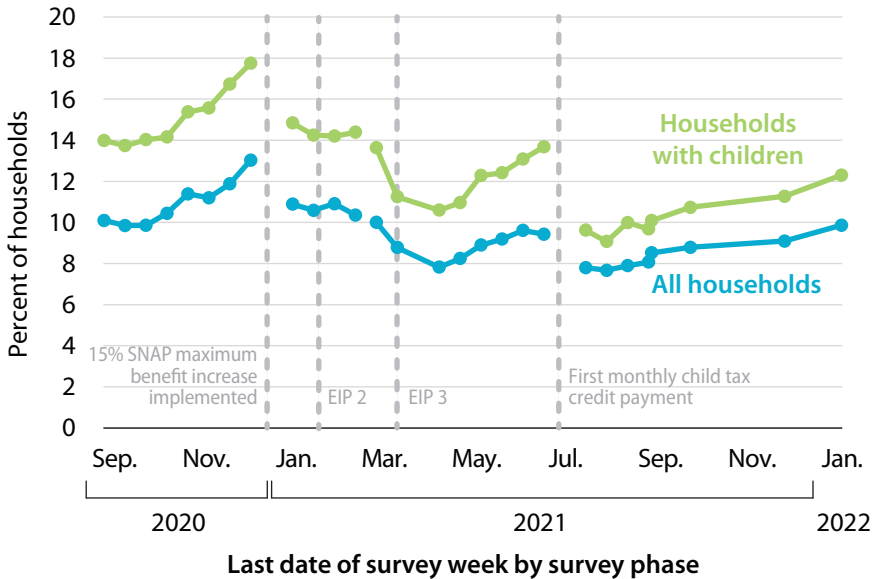
Additional financial resources provided to families as part of the federal relief efforts coincided with immediate reductions in estimates of food insecurity, suggesting that federal relief efforts were somewhat, but not entirely, effective (Figure 7.6).²³ Food insufficiency among households with children started to decline in January 2021 after the 15 percent increase in the maximum SNAP benefit was implemented, declined again in March 2021 after the EIP, and declined again in July of 2021 after the first CTC payment but increased in October 2021 after the UI boost expired. Undocumented migrant farmworker households reported some of the highest rates of food insecurity during the pandemic (Burton-Jeangros et al. 2020), which is consistent with their being less likely to take up SNAP and WIC (Pelto et al. 2020).²⁴

23. This real-time measure of food insufficiency shows the relationship between the timing of resources and food hardship, while the annualized statistics report a cumulative and retrospective measure of food insecurity. Unfortunately, the data are only available using consistent methods of data collection during the pandemic, so it is difficult to compare these data to data on food insecurity from before the pandemic.

24. In a study of primarily Spanish-speaking families participating in the WIC program and presenting for pediatric care in Texas, 64 percent reported food insecurity between April and May 2020 (Abrams et al 2020).

FIGURE 7.6

Rates of Food Insufficiency in the Last Seven Days, May 2020–January 2022



Source: Census Household Pulse Survey 2020–22; authors' calculations.



Note: Households are considered food insufficient if they report that they are sometimes or often not able to get enough to eat in the previous 7 days.



Lessons for the Next Economic Downturn

Children suffered as a result of the pandemic and recession but less so than they would have without fiscal support. The (mostly) swift policy response is likely to pay significant dividends in terms of improved child nutrition, health, and academic achievement. Research suggests this will translate into improved future labor market outcomes and reduced reliance on public support relative to what otherwise have occurred (see Hendren and Sprung-Keyser 2020 for a review of the returns to public spending on children). However, some policies were more effective than others in relieving child suffering.

Cash and near-cash transfers, including SNAP, Pandemic EBT, CTC, UI, and EIPs, all reduced poverty, housing insecurity, and food insecurity. Targeting income transfers to those with less attachment to the labor force (often women) and families with children through direct payments and refundable tax credits are predicted to reduce the child poverty rate for 2021 to a level below the adult

poverty rate for the first time. The lesson here is that such policies are effective at reducing poverty even during times of economic stress.

Despite the unprecedented nature of the income support provided during the pandemic to families with children, it appears not to have been enough to prevent children from experiencing increased food insecurity. We need to understand whether some disadvantaged households failed to fully benefit from the fiscal support or whether it simply was not sufficient. It is also possible that food insecurity increased because of supply chain shortages that affected food availability more broadly. To fully understand food insecurity during the pandemic, we must continue collecting better data on food insecurity among different groups to understand how and why families fall through the cracks. Had the SNAP maximum benefit been increased earlier in the pandemic, food insecurity would likely have risen less among children.

Authorizing brand-new programs during a downturn has advantages and disadvantages. The new methods for delivering nutrition assistance—prepared meals at community sites, Pandemic EBT for out-of-school children, and new distribution channels for food banks—were targeted and pandemic-specific responses. However, there are certainly disadvantages to standing up new programs during a crisis. Better preparation in the ability to target resources to children, in nutrition assistance and other programs, would have sped resources and alleviated hardship during the early months of the recession.

There is evidence that school closings caused harm to children's academic outcomes, indicating that such actions should be minimized wherever possible. Providing school funding to the states will mitigate reductions in school budgets that usually follow recessions and typically take years to reverse. While linking the federal allocations to Title I had the effect of providing more aid to lower income states, a reassessment of whether the states hardest hit by the recession received adequate funding is needed to make sure such funding is most effectively targeted in the next recession.

One group of children who received little government support are children who are undocumented immigrants or the children of undocumented immigrants. For these children, schools can be an important delivery mechanism for providing aid (Brannen and O'Connell 2022; Rabbitt, Smith, and Coleman-Jensen 2016). Policymakers should find creative ways to leverage that mechanism in the next recession.

Flexible funding for private child care is crucial and must come early to prevent center closings. Private child-care providers can weather major downturns in the economy and concomitant reductions in use and remain open. In addition to arriving early, funding should be flexible (i.e., not tightly tied to actual utilization) and targeted to low-income families. Using CCDF to allocate funds minimizes any delay.

Subsidizing premium payments through the ACA exchanges and COBRA coverage increased health insurance coverage, though by far less than Medicaid, especially for children. A combination of Medicaid and adequate ACA subsidies

can largely offset declines in private health insurance coverage for children and parents during recessions. Providing enhanced Medicaid matching rates to the states, tied to requirements limiting states' ability to disenroll Medicaid beneficiaries, appears critical to achieving that result.

Better child-centric data collected early and at a high frequency are needed. While the Census Pulse survey was a very useful innovation, it was not designed to capture much child-specific information (i.e., no health insurance coverage questions related to children) and included child-specific questions only much later in the pandemic (i.e., questions on child-care visits were not included until April–July of 2021). Moreover, it suffered high rates of nonresponse and likely underreporting of safety net use as well. The lack of timely data makes it difficult for policymakers and others to monitor the impact of the recession on children and ascertain whether the federal response has been adequate.

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Lessons Learned from Monetary and Fiscal Policy during COVID-19

Robin Brooks and Jonathan Pingle¹

Introduction: The Pandemic Response, and Can It Be Repeated?

We hope the pandemic was a unique economic shock. The U.S. Congress, the President, and the Federal Reserve (the Fed), the nation's central bank, responded in force to support the economy and mitigate the negative effects of lost income for American households and businesses. In this chapter we review the experience in the markets for U.S. government debt to understand what the episode teaches us about the ability to respond to future crises and the interaction between fiscal and monetary policies.² The fiscal policy response played a crucial role in supporting the economy by replacing lost income and providing the types of economic support that monetary policy is not well suited to provide. The scale and the speed of the fiscal response, totaling more than \$5 trillion, or more than 20 percent of GDP, was facilitated by the actions of the Fed, which helped to keep interest rates low and purchased more than \$3 trillion of U.S. Treasury securities alongside the U.S. Treasury issuance.³ Without the Fed's response, the ability of the Treasury to finance such a large,

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 2. Similar issues are addressed in Reis (2022b).
 3. Note that we use the fourth quarter of 2019 level of nominal GDP when we refer to shares of GDP. When we refer to debt, we refer to debt held by the public. The Fed is included in the definition of the term "public." For the descriptions in the Treasury's monthly statement of the public debt, see TreasuryDirect.gov (n.d.).

swift fiscal response without sparking a rise in borrowing rates seems to us unlikely, considering the evidence.

For example, worrying signs about debt issuance emerged during the pandemic. Foreign buyers of Treasuries played a much smaller role as a source of demand for Treasury bond issuance during the pandemic, in contrast to their large role following the 2008 global financial crisis (GFC). In addition, during past crises panic and risk aversion sent investors to the safety of Treasury securities. However, flows went the other way in early 2020, with foreign central banks selling Treasuries at the height of the crisis, pushing yields on Treasury debt higher. To improve market functioning, the Fed stepped in and bought Treasury bonds in large size, restoring order. While much of the turmoil in March 2020 reflects problems with the microstructure of the Treasury market (Financial Stability Board [FSB] 2020; Group of Thirty Working Group on Treasury Market Liquidity 2021; Vissing-Jørgensen 2021), the widespread selling of Treasury bonds is still an uncomfortable fact to consider when weighing the ability of the United States to respond rapidly to future crises.

Initial asset purchases by the Fed addressed market dislocation. Later, the Fed purchased Treasury bonds and agency mortgage-backed securities (MBS) to keep longer-term interest rates low, prevent unwanted tightening of financial conditions, and support economic recovery. The purchases are called large-scale asset purchases (LSAPs) or quantitative easing (QE). We survey empirical estimates of the impact on Treasury yields in this chapter. Overall, the Fed appears to have played a crucial role in facilitating the fiscal response by maintaining low Treasury yields at a time when the U.S. needed to issue a large amount of debt quickly. At the very least, the Fed helped avert any potentially harmful adjustment costs associated with the sharp rise in debt issuance in 2020 and 2021.

Treasury yields are determined by many factors, among them the amount of government debt outstanding. Despite the massive debt increase, for most of the past two years yields on U.S. government debt remained lower than prior to the pandemic and have failed to push much higher. Low real and nominal interest rates signal limited negative impact on economic growth that could result from rising debt issuance pushing up interest rates. Low rates paid on U.S. government debt also are important for keeping government debt service costs manageable. In this chapter, we evaluate why the pandemic response left yields low amid a sharp increase in supply of U.S. government debt. We use evidence from our evaluation to consider the implications for the scope of a future fiscal response to a crisis and what the potential limits might be.

We argue that one limit is inflation. Inflation could undermine the Fed's ability to keep (nominal and real) yields low for periods of time and in turn could also undermine the Fed's ability to help facilitate a large fiscal response to a future crisis. For example, if inflation had been high at the onset of the pandemic, the central bank response might have been more cautious. Or, if the policy response had proved to be highly inflationary right away, the central

bank might have been forced to raise real interest rates harmfully high to push inflation down. That, in turn, could have affected government borrowing costs, undone some of the economic benefits of the emergency response, or revealed a risk of too-high inflation or of too-high inflation expectations.

Intergenerational concerns should also be considered since fiscal stimulus or use of the central bank's balance sheet can be used in the near term at the expense of future generations' scope to do the same. All that said, as of this writing in March 2022, the U.S. experience does not yet appear worrisome and material room for a large, rapid, future fiscal policy response appears to remain. We argue, however, that this ability depends crucially on the independence and inflation-fighting credibility of the Fed, the stability of the U.S. dollar, and the maintenance of low and stable inflation.

Timeline and Description of Monetary–Fiscal Coordination

Before the onset of the COVID-19 pandemic, the Fed was undertaking regular purchases of Treasury bills to add needed reserves to the banking system.⁴ Reserves are needed by banks to facilitate interbank payments, to satisfy regulatory requirements, and to accommodate withdrawals by customers. The mechanics are as follows: in exchange for a Treasury bill or bond, the Fed credits the seller's account in the banking system with reserves as payment for the security, thus expanding the overall level of reserves in the U.S. banking system. At the start of 2020, the Fed was purchasing \$60 billion per month of Treasury bills (i.e., short-term U.S. government debt), and reinvesting up to \$20 billion per month of the principal and interest payments from its MBS into U.S. government debt across the maturity spectrum. While not intended to put downward pressure on bond yields, the purchases were removing as much as \$80 billion of U.S. government debt from private markets each month.

The Fed was also reviewing its monetary policy framework. Over the preceding decade, the Federal Open Market Committee (FOMC) largely failed to get inflation to its 2.0 percent target. This failure followed the Bank of Japan and European Central Bank chronically undershooting their inflation targets, even with their policy rates pinned at zero or below. At the start of 2020, no FOMC decision on a new strategic framework for monetary policy had been made, but the review was under way. The effective federal funds rate was 1.55 percent, at the lower end of the Fed's target range for the rate (1.50 –1.75 percent). The 10-year Treasury yield ended 2019 at 1.92 percent, a level that has only recently been reattained.

4. A fuller description of reserves is developed below in our discussion of the Fed's role and LSAPs.

On January 7, 2020, authorities in China confirmed a pneumonia-like virus as a novel coronavirus. The 10-year yield closed at 1.84 percent on January 17. On January 21, officials in Washington State confirmed the first case in the United States. Yields then drifted lower as investors began to de-risk, moving from assets like equities to the safety of U.S. government bonds. The rising demand for Treasuries pushed up their price and pushed down their yields, and the 10-year yield fell to 1.51 percent. As news worsened throughout February, the flight to safe-haven Treasury bonds intensified. The 10-year yield fell to 1.10 percent on March 2. On March 3 the FOMC voted to reduce the federal funds rate by 50 basis points (bps), citing strong economic fundamentals as well as risks posed by the coronavirus. Concerns mounted. The 10-year yield fell to 0.54 percent on March 9 and the 30-year yield fell below 1 percent, a new low.

Following OPEC's surprising failure to cut oil production at its March 5 meeting, oil prices fell sharply, dropping from \$46 to \$30 per barrel. Emerging market countries, many of whom are commodity exporters, were forced to defend their falling currencies, selling Treasury securities to raise cash. The 10-year Treasury yield rose sharply, reaching 1.20 percent in mid-March. In this dash for cash (or dash for dollars), some other investors facing redemption risk or locking in capital gains similarly moved to raise cash. Selling mounted and seized the market, pushing yields higher. Broker dealer balance sheets proved to be insufficient to intermediate the size of the sudden flows.⁵ Along with the seizure of the Treasury market, concern over the economic outlook mounted. On March 15, in a rare Sunday decision, the FOMC cut the policy rate by a full percentage point, taking the target range to 0–0.25 percent. Importantly, seeking improvement in Treasury debt market functioning, the FOMC announced moving away from bill purchases to purchases of Treasury notes and bonds, saying it would be buying at least \$500 billion in Treasuries and at least \$200 billion in MBS over the coming months. To fulfill its role as lender of last resort, several emergency lending facilities were activated to provide liquidity backstops for other lending markets. The Fed lowered the primary credit rate at the discount window by 150 bps, which allowed banks to borrow directly from the Fed at 0.25 percent. By the end of March, market

5. Following the turmoil in the Treasury market in March 2020, the Fed created two new facilities that—if selling pressure in the Treasury market recurs—would provide a way for market participants to temporarily convert their Treasury securities into dollars, or cash, without selling them. The Fed's Standing Repo Facility provides overnight loans to eligible counterparties who post their Treasuries as collateral. This facility lends at a higher rate than interest paid on reserve balances, but also can allow banks to access reserves directly from the Fed in times of stress. In addition, the Federal Reserve Bank of New York now offers Foreign and International Monetary Authorities (FIMA) account holders a similar service, allowing them to pledge the Treasury securities held in their custodial accounts at the Federal Reserve for overnight loans in dollars. This may reduce the need for foreign official institutions to sell Treasuries when emerging market or other currencies are depreciating, or when they are in need of dollar funding but might not have access to other existing Fed swap lines.

functioning had been restored to the Treasury market and the 10-year yield was back down to 0.70 percent.

A full review of those Fed emergency lending facilities is beyond the scope of this chapter, but two of those facilities represented novel examples of monetary–fiscal coordination. After the GFC, the Fed set up facilities that would lend to private markets, as a backstop and usually at a penalty rate, to make available liquidity to support orderly market functioning. Similar market backstops, with the cooperation of the Treasury and this time seeded with some emergency funding from Congress, were reintroduced during the pandemic.⁶ One of the new facilities was the Paycheck Protection Program (PPP) liquidity facility. The PPP was a pandemic lending program created by the Coronavirus Aid, Relief, and Economic Security Act (CARES Act) and was administered by the U.S. Small Business Administration. The PPP provided loans to businesses with the stated purpose of keeping employees on the payroll during the pandemic (see Chapter 4). To support banks providing the credit, the Fed extended credit to eligible financial institutions that originated PPP loans; those institutions then used the PPP loans as collateral. The action was like creating a secondary market for PPP loans on short notice, supporting the flow of credit to firms. The Fed’s facility was an attempt to help make fiscal policy more successful.

The second novel example of monetary–fiscal cooperation was the creation of the Municipal Liquidity Facility. It was designed to purchase short-term notes from U.S. states and municipalities meeting certain criteria. In other words, it extended credit directly to some states and cities. While the facility was little used, the existence of such a market backstop contributed to orderly functioning of the municipal securities market, which was an important source of credit for states and municipalities that were managing their own fiscal responses to the pandemic. The facility was seeded with CARES Act funds and was established in coordination with the Treasury (see Chapter 6). Both facilities now provide a template for potential future cooperation.⁷

But the scale of what occurred in the market for Treasury debt was extraordinary. In seven weeks during March and April 2020, the Fed’s System Open Market Account (SOMA) purchased \$1.45 trillion of Treasury debt. The Fed undid the dislocation that had pushed up yields, and restored more normal functioning, with orderly transactions and auctions of new issuance. In addition, the

6. A full list with links and explanations can be found in the policy tools sections of the Federal Reserve’s website (Board of Governors of the Federal Reserve System n.d.a., n.d.b.). Note that, in evaluating the Coronavirus Aid, Relief, and Economic Security Act, or CARES Act, the CBO estimated the seed funds for the Fed facilities to be deficit neutral. As of this writing in early 2022, of the \$114 billion in Treasury contributions to the credit facilities, most has been returned to the Treasury, with only \$21 billion remaining, because the facilities have been, or are in the process of being, wound down. Note that the special lending facilities are set up only under certain emergency conditions and/or with the approval of the Treasury.

7. The Federal Reserve Act does allow the Fed to purchase state and municipal debt in the secondary market (open market operations), but with a number of restrictions. See Section 14, subsection 2b of the Federal Reserve Act.

FOMC pledged ongoing purchases to support market functioning and—once market functioning had been restored—settled into a more traditional LSAP, purchasing securities at a pace of \$80 billion of Treasury notes and bonds and \$40 billion of agency MBS per month. In the 18 months ending in June 2021, the Fed added \$2.9 trillion to its holdings of U.S. government debt, bringing the total in the SOMA to \$5.2 trillion in June 2021.⁸

The fiscal response was extraordinary, too. Two legislative responses, passed in early and mid-March, provided funds to state and local governments, provided payments and tax credits to employers, and expanded sick leave. The more significant response, the CARES Act, passed in late March. Initially estimated to cost \$1.7 trillion, the bill provided support to businesses and health-care providers, and provided additional funding to state and local governments. Additional funding was enacted in late April. The overall deficit impact of the four bills was expected to exceed \$2 trillion in just fiscal year 2020, the year ending September 30.⁹

On April 29, 2020, Fed chair Jerome Powell urged lawmakers to use the great fiscal power of the United States to defeat COVID-19 (Powell 2020). He said that monetary policy alone would not suffice; this is a theme he would revisit during the pandemic. With lost income and business central to the economic problem COVID-19 posed, monetary policy was not the right tool for the job. In May 2020, the Speaker of the House Nancy Pelosi reported that the Fed chair urged Congress to “think big” and take advantage of low interest rates (Pelosi 2020a). The House passed a \$3 trillion relief bill later that month; on the House floor the speaker said, “We have the responsibility and opportunity to think big, as he [Powell] advised” (Pelosi 2020b). Treasury markets watched this unprecedented monetary–fiscal cooperation amid continued low yields. However, further meaningful fiscal action was delayed until late December 2020, after the general election on November 3. After employment fell by well over 20 million in March and April 2021, employment rebounded in May with the beginnings of reopening and economic recovery began. The 10-year yield was largely rangebound from early April 2021 until early June 2021, at between 0.6 percent and 0.8 percent.¹⁰

8. Over 78 weeks ending the end of June 2021, the Fed purchases of Treasury debt totaled \$2.9 trillion; over the 104 weeks ending February 23, 2022, those purchases totaled \$3.3 trillion, bringing total holdings in the SOMA to \$5.7 trillion.

9. As part of that cost estimate, the new Fed facilities established by the legislation were expected to show no losses and thus to have a cost of zero.

10. The Fed also implemented several facilities to backstop private markets that stabilized market conditions across credit markets and municipal borrowing. Although the Fed was designed to be the lender of last resort at a time when the vast majority of lending was done by banks, it responded to the pandemic by implementing several facilities to backstop credit markets, an important source of lending in today’s financial system. The initial rebound in employment in May pushed yields above 0.9 percent ahead of the Fed’s June meeting, but then settled back into the range for the remainder of the summer.

At the annual Jackson Hole Economic Symposium on August 27, 2021, Chair Powell announced the results of the Fed's framework review (Powell 2021). First, the FOMC would seek to achieve inflation that averages 2.0 percent over time. Previously, the committee had sought 2.0 percent inflation (called inflation targeting), but if inflation spent more time below 2.0 percent than at 2.0 percent, those bygones would be bygones and inflation could easily average something below 2.0 percent, as it had for the preceding decade. Going forward, if inflation spent time below 2.0 percent, it would need to spend time above 2.0 percent, and the public should expect an overshoot. The rule was not meant to be hard and fast like a specific target for a level of prices. Hence, the strategy that replaced inflation targeting was called "flexible average inflation targeting."

Second, Powell (2021) announced that the FOMC would seek to eliminate shortfalls from maximum employment. In other words, employment shortfalls below target would require a policy response to be eliminated; if employment was above or better than estimates of maximum employment, however, there would be no preemptive policy response to push employment back down, unless sufficient inflation materialized to put maintaining the inflation target at risk.¹¹ The framework change was not a response to the pandemic, but rather was an attempt to retain the policy space to fight future downturns more effectively.

The next step in fighting the economic crisis came with the forward guidance the FOMC introduced in September 2021. By then, yields had begun to grind higher as recovery became more likely, and vaccine progress continued. However, the FOMC wanted to prevent potential undue tightening of financial conditions, and to deploy its tools as best it could to support the economic recovery. At its September meeting, the FOMC made a lower-for-longer commitment, nesting forward guidance within the new policy framework. The committee expected that it would be appropriate to maintain the funds rate near zero until three economic conditions had been met: the labor market had returned to full employment, personal consumption expenditures (PCE) inflation had risen above 2.0 percent, and inflation was expected to overshoot the 2.0 percent target.

At its December 2020 meeting, the FOMC adopted forward guidance for the asset purchase program, saying it expected to maintain the purchases of \$80 billion per month of Treasury securities and of \$40 billion per month of agency MBS until the economy made "substantial further progress" (Board of Governors of the Federal Reserve System 2021a) toward the committee's goals. The LSAPs were also acknowledged to be part of the monetary policy response and not just to support market functioning.

11. In his speech Chair Powell noted the erosion of policy space from generally declining neutral interest rates (the underlying trend in the structure of rates) over the preceding two decades, and the compounding problem of declining inflation expectations (Powell 2021). The Fed sought to arrest the erosion of its policy space with the new framework, and to better anchor inflation expectations at its 2.0 percent target.

The next catalyst for Treasury markets followed the election of Joseph Biden to the presidency. First, a bipartisan budget bill (the Coronavirus Response and Relief Supplemental Appropriations Act) that had been enacted at the end of 2020 included another about \$900 billion in fiscal stimulus to address the hardships caused by the pandemic. Then, the subsequent run-off election of Georgia's two Senate seats led to Democratic party control of both houses of Congress as well as the White House. The prospects for further fiscal expansion pushed up market expectations for growth, inflation, and debt issuance. On January 5, 2021, the 10-year yield closed at 0.96 percent. January 6, the day after the Georgia run-off election, yields closed at 1.04 percent and were 1.15 percent on January 11. The incoming Biden administration began discussing an ambitious fiscal response. On March 11 the \$1.9 trillion American Rescue Plan Act of 2021 was enacted. Combined with vaccines and economic optimism, the 10-year yield ended the first quarter of 2021 at 1.74 percent.

After that quarter, expectations of debt issuance crested. Despite the amount of spending approved in the fiscal legislation, on February 3, 2021, the Treasury announced that the past year's increases in nominal coupon (maturities longer than bills, or two years and beyond) issuance created sufficient capacity to address near-term borrowing needs. Many analysts thought the Treasury might reduce coupon auction sizes at some point in the coming quarters, which has in fact occurred. As the remainder of 2021 unfolded, Congress also passed a bipartisan infrastructure spending bill and a budget resolution that would widen deficits by another \$1.75 trillion over a decade.

Following that extraordinary monetary and fiscal response, inflation moved higher in 2021. The Fed announced its intention to begin to pare back asset purchases in September 2021. In the fourth quarter of 2021, core PCE inflation moved above 4 percent, which was above the Fed target of 2.0 percent. Some observers became concerned that the increase in inflation might not prove transitory. The FOMC announced it would accelerate its exit from the LSAPs in December. In January 2022, the FOMC said that it would be appropriate to raise interest rates "soon" (FOMC 2022). Investors were substantially changing their views of the Fed's asset holdings, as expectations that the Fed would shrink its holdings became more widespread and were pulled forward. As of this writing in March 2022, core PCE inflation is more than 5 percent, and headline inflation is roughly 6 percent. Expectations for interest rate increases had repriced substantially higher compared to only five months earlier. As of this writing, the 10-year Treasury yield is above 2 percent, as the Fed stands poised to raise interest rates, with a series of rate hikes priced into Treasury bond valuations.

The magnitude of the policy response was historic. Net deficit spending in response to the pandemic and to support the recovery totaled more than \$5 trillion. Estimates of debt-to-GDP for fiscal year 2021 were revised up 20 percentage points in a year, under current law. The next-largest fiscal expansion in the past 100 years was during World War II, when debt-to-GDP rose 65

percentage points. Then, too, the Fed played a role, for a time keeping wartime borrowing costs low by targeting certain yields for U.S. government debt, which ensured the ability of the Treasury to issue debt as needed without a spike in borrowing costs. The war's debt burden was then reduced in the decades that followed. Today, the ratio of debt held by the public to nominal GDP has risen to more than 100 percent, nearing the World War II peak of 106 percent. Looking ahead to the next crisis: Will the United States have the fiscal space needed to fight a war, respond to a pandemic, or support the economy in a very deep recession, particularly when monetary policy is constrained by the zero lower bound on nominal interest rates?

Three points are worth noting. First, even before the pandemic, the long-run fiscal outlook for the United States was not expected to stabilize without changes to fiscal policy. Debt projections climbed rapidly beyond the 10-year budget window. The massive increase in debt during the pandemic made these challenges worse: CBO's March 2021 long-run projections show the debt rising to 200 percent of GDP under current law over coming decades.¹² Second, interest rates matter for the ability to finance that debt, and to keep debt service manageable. Finally, as costless as any spending might appear to be, there is a limit to how much debt the United States government can issue without significant increases in interest rates, which raises important trade-offs for policymakers to consider. Does today's deficit-financed response to the crisis risk limiting a future generation's response?¹³

Another important part of the backdrop is the decline in neutral real interest rates. Nominal and real interest rates in developed market economies have declined noticeably over the past several decades. Some estimates suggest that the neutral real policy rate, or the equilibrium level of the FOMC's overnight policy interest rate, had fallen almost 2 percentage points during the past few decades. In the United States, that decline since 2000 moved in the opposite direction of the ratio of government debt-to-GDP, which in theory should push up neutral interest rates. In the year preceding the pandemic, market-implied expectations suggested that real neutral interest rates would remain low in the coming years.

That decline in neutral real rates led to rethinking the role of fiscal policy. As Olivier Blanchard (2019) said, "Put bluntly, public debt may have no fiscal cost." Lukasz Rachel and Lawrence Summers (2019) show that advanced economies' neutral rates fell around 300 bps in the half century leading up to COVID-19, a phenomenon they link to global savings. Many factors may have driven the decline in neutral rates, including slowing potential output growth across advanced economies coming from lower productivity growth and population aging. Policy rates' proximity to their effective lower bound might also raise

12. For the detailed assumptions, see the CBO outlook (CBO 2021).

13. As discussed in Reis (2021, 2022a), some could argue that the United States trimming its primary deficit to, say, 2.5 percent, and such a rate structure keeping net interest payments under 2.5 percent, would be sustainable in the long run.

expectations for future LSAPs, which could reduce term premia. There is also a literature on excess savings that harks back to work on the global savings glut, a term pioneered by Ben Bernanke (2005). In more recent work, Thiago Ferreira and Samer Shousha (2021) argue that the global net supply of sovereign safe assets (traded in secondary markets) plays an important role in real neutral rates. While added supply (say, rising U.S. government debt) was estimated to have pushed up real neutral rates, the accumulation of safe assets by official institutions and central banks was estimated to have pushed down real neutral rates. Blanchard (2019) argued that nations could be better off with expansionary fiscal policy, given the outlook for low real neutral interest rates to remain in place in the coming years. If the real rate of interest on government debt is lower than the rate of return from investment financed by that debt, society could be better off by increasing government borrowing. If the interest rate on government debt, r , is less than the growth rate of aggregate output, g , that possibility seems more likely.

As of this writing, market-implied estimates of real neutral rates remain low. Longer-run inflation expectations remain within their post-2000 ranges. Responding to the pandemic with a fiscal response seems unarguably the right thing to have done. In the case of the pandemic response, not only was there a clear role for fiscal policy, but the Fed played an important role too. The Fed lowered interest rates at a time when the Treasury needed to issue a historic amount of debt, and very quickly. The Fed also ensured market access for the Treasury by its forceful response to improve market functioning. We are still running this experiment, however, and the longer-run effects of the increase in debt remain to be seen. We discuss these takeaways in more detail below.

Fiscal Expansion: Role of Domestic and Foreign Demand for U.S. Government Debt

During the COVID-19 pandemic, holdings of U.S. government debt expanded among some parts of the buyer base, but not among others. Primarily four types of buyers added to their holdings on net: First, Fed holdings increased the most, by far.¹⁴ Second, money market funds that limit their holdings to government or agency debt played the second largest role. Third, domestic depository institutions, for whom holdings of Treasury or government agency debt satisfy regulatory requirements, added holdings. Fourth, overseas investors added to net holdings, though in much smaller amounts than during the GFC.

Other than foreign investors, no type of investor other than the Fed or investors facing a meaningful regulatory requirement to own Treasury bonds added significantly to their net holdings of U.S. government debt during the

14. We ignore state and local government holdings for the most part. Their holdings of Treasury bonds include special series, and they also received funds from the fiscal expansion that they, in turn, will spend over time. The simplification we argue does not detract from the points made in the chapter.

TABLE 8.1

Flow of Funds Estimates of U.S. Government Debt Held by the Public

U.S. Government Debt Held by the Public	Treasury Estimates (billions of dollars)			Changes since 2019 Q4		
	2019 Q4	2020 Q2	2021 Q1	2020 Q2	2021 Q1	Share (%)
Total Liabilities	19,019	22,371	23,943	3,352	4,924	100%
Households (inc. HF's) and nonprofits	1,560	263	1,261	-1,297	-299	-6%
Nonfinancial business	138	192	140	55	2	0%
Monetary authority	2,541	4,808	5,273	2,267	2,733	55%
Money market mutual funds	1,037	2,350	2,363	1,313	1,326	27%
Pensions and insurance companies	1,278	1,359	1,405	81	127	3%
U.S. depository institutions	704	927	1,111	223	407	8%
Other banks and credit unions	291	302	264	11	-27	-1%
Mutual funds and ETFs	1,546	1,481	1,549	-65	3	0%
Broker dealers	230	268	19	38	-210	-4%
GSEs and other financial	267	439	382	172	115	2%
State and local governments	850	1,069	1,166	220	317	6%
Federal gov defined benefit plans	1,888	1,866	1,983	-21	95	2%
Rest of world	6,691	7,047	7,027	356	336	7%

Source: Federal Reserve Board Flow of Funds (Z.1) 2021b.

Note: Values are rounded to the nearest million. HF's refers to Hedge Funds.



pandemic. Private domestic buyers, who were free from regulatory requirements or other restrictions, reduced their holdings of U.S. government debt. Table 8.1 shows holdings of U.S. government debt that changed during the pandemic based on the Fed flow of funds data.¹⁵ Fed purchases accounted for 56 percent of issuance through the first quarter of 2021.¹⁶ Money market mutual funds absorbed 27 percent and banks bought 8 percent. Foreign investors accounted for 7 percent of the newly available debt.

15. Similar decompositions can be done with the Treasury tables OFS-1 and OFS-2. Note that, in the Fed's flow of funds data, the term "households" also includes nonprofits and some types of investors, including hedge funds. In addition, the category includes the instrument discrepancy; for the time periods considered the fourth quarter of 2019 and the first quarter of 2021, however, that fact did not materially contribute to the change in estimated holdings.
16. Although debt issuance continued, as did Fed asset purchases, we thought this was a good interval to evaluate the rapid initial 12-month period's changes. The second quarter and third quarter of the flow funds data adds the complication of large fluctuations in bill issuance due to the debt management surrounding the debt ceiling, without revealing any meaningful differences in the takeaways. Indeed, as the Fed purchases continued, that share of debt taken down rises in the next two quarters.

Domestic banks took down roughly 8 percent of the pandemic increase in issuance. They are a natural buyer of Treasury debt because they are required to hold high-quality liquid assets to meet liquidity requirements and Treasury bonds have more favorable risk weightings than other assets used in computing regulatory capital requirements. Included in that definition is Treasury debt because it is both safe and very liquid. Thus, buying U.S. government debt satisfies important regulatory requirements for domestic banks.

Money market mutual funds, to some extent, are captive buyers of government debt due to regulatory requirements imposed following the GFC. Before the pandemic, 69 percent of money market assets were in funds restricted to holding short-dated U.S. government or agency debt, called government-only funds. Deposits in government-only funds soared as the Fed ramped up asset purchases in March and April 2020, the fiscal response began, and household savings rose. Government-only money market fund balances increased \$1.1 trillion during the pandemic, and six quarters later represented roughly 80 percent of money market fund deposits, totaling \$3.9 trillion. Government-only money market funds also can and do invest their cash—\$1.7 trillion a day in February 2022—at the Fed’s reverse repurchase (RRP) facility (effectively securities bought from the Fed with an agreement to sell them back at a fixed time and price). The high level of usage of the RRP suggests there will be ample demand for additional U.S. government debt if bill issuance increases.

As the policy response unfolded during the pandemic, households reduced spending and savings in the U.S. rose. Despite that rise in savings, households reduced their Treasury debt holdings, as shown in Table 8.1.¹⁷ Hedge funds and some types of investors are included in that definition of households, but domestic hedge fund holdings fell by a little under \$100 billion over the period shown in Table 8.1, from the fourth quarter of 2019 to the first quarter of 2021. Households accounted for roughly 40 percent of the money fund deposit growth through the first quarter of 2021, thus households indirectly added to their holdings of short-term U.S. government debt. However, our estimate of households’ holdings from the flow of funds data indicates households reduced their Treasury holdings on net by somewhat more than their money fund balances rose over the six quarters after the fourth quarter of 2019.¹⁸ Even accounting for households implicitly holding Treasury bills via their money market deposits, altogether households essentially failed to participate in absorbing the rapid rise in debt issuance to any meaningful degree.

After the GFC, overseas buyers of U.S. government debt played an important role in absorbing the additional U.S. government debt issuance. For

17. Even in the next two quarters of the flow of funds, the Treasury holdings of households had not recovered.

18. The timing matters somewhat because households’ Treasury holdings fell, and money fund balances rose; overall, however, households as defined by the flow of funds data were not a meaningful net part of the buyer base during the pandemic.

example, after accounting for the issuance of debt during and following the GFC, overseas buyers' increases in holdings accounted for taking down most of the increase in debt held by the public. During the pandemic this share was much smaller. Historically, the rest of the world has been an important and sizeable holder of Treasury securities, and indeed is an important marginal buyer. Since the sharp fall in commodity prices in 2014 and a material rise in the dollar, foreign net flows into Treasuries have been close to zero in recent years, despite the large stock of overseas holdings. Overseas buyers' failure to participate in absorbing pandemic issuance raises important questions about whether, without the Fed, such a large amount of U.S. government debt could have been placed so quickly on such attractive terms.

Also, one might regard the banks and money market funds as somewhat captive buyers. That might not be quite fair for banks, but government-only money market funds can own only government or government agency obligations; for banks, government Treasury debt satisfies important regulatory requirements. Excluding their added holdings and the Fed holdings, the remaining U.S. government debt trading in bond markets has been stable at roughly 60 percent of GDP since 2018. In other words, the ratio of debt to nominal GDP held by the public (excluding the holdings of the Fed, money market funds, and domestic banks) has changed little between the days before the pandemic and a year after its onset. That could be one reason yields remained well contained in the face of new public debt issuance of more than 20 percent of GDP (Figure 8.1).

Why Yields Are Low: Inflation, Growth, and Neutral Rates

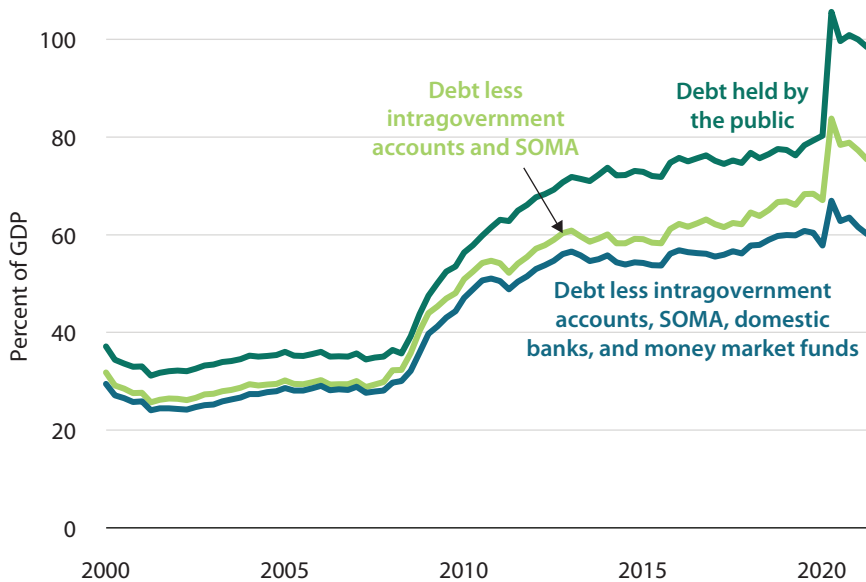
Below we decompose the 10-year Treasury yield into components. If market-implied futures are correct, the pandemic experience suggests little risk from bond markets of repeating this expansion of federal debt. Longer-run inflation expectations remain well contained, despite near-term inflation concerns, and market-implied assessments of future neutral rates remain low. We discuss the risks to that outlook later.

In Figure 8.2 the 10-year nominal Treasury yield is decomposed into four parts.¹⁹ One component is the contribution of expected future inflation. A second is the inflation risk premium. Inflation erodes the value of the dollar and any dollar-denominated bond. The inflation risk premium represents the return that investors demand as compensation for expected future inflation and the risk of higher-than-expected future inflation. Overall, longer-run inflation expectations have returned to roughly pre-pandemic levels, remaining contained despite higher actual inflation. That is one reason why the 10-year nominal yield has not moved

19. We use the D'Amico, Kim, and Wei (DKW) decomposition (see D'Amico, Kim, and Wei 2018). Other decompositions and estimates of term premium and inflation compensation yield qualitatively similar contours.

FIGURE 8.1

U.S. Government Debt as a Percent of GDP



Source: Haver n.d.

Note: SOMA refers to System Open Market Account.



higher with that inflation. Looking at other longer-dated forward indicators of inflation expectations in surveys and financial markets—for example, the expected five-year ahead rate of inflation five years from now—they remain in their post-2000s range, a period where actual inflation remained near or below 2.0 percent, on average. One risk going forward, and that could one day be viewed as the result of the pandemic response, is that the current high inflation feeds into those longer-run inflation expectations and pushes bond yields higher.

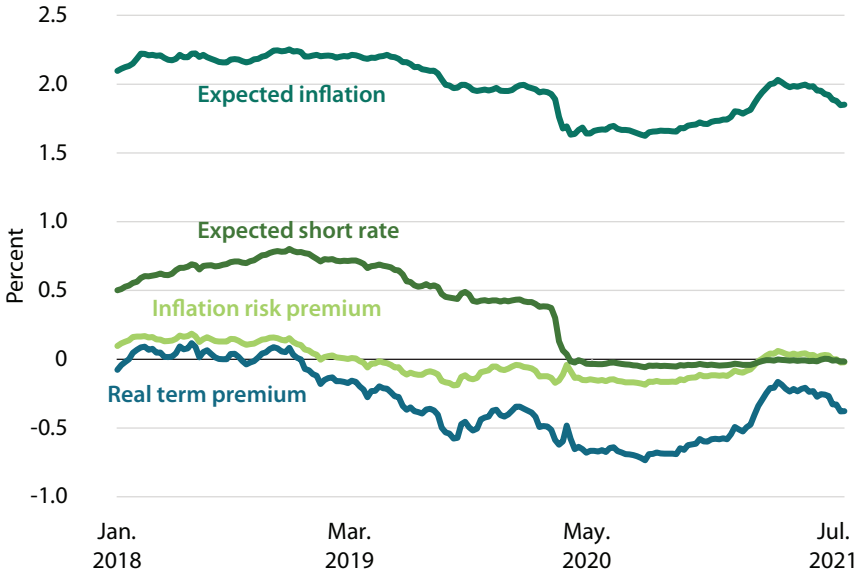
The third component is the real expected overnight interest rate.²⁰ This represents the real future path of the Fed's policy rate. This contribution to the 10-year yield is affected by expectations for growth and employment, as investors assess how the central bank might respond to economic conditions in the coming decade.²¹ By the end of 2021, the market started expecting more Federal Reserve interest rate increases than it had during most of the pandemic,

20. The real overnight rate is the nominal rate over the period net of expected inflation.

21. To see how this contributes to the 10-year yield, imagine an overnight rate paid for 10 years into the future. An investor can earn that as an alternative, based on the Fed's overnight policy rate; the investor just needs to roll that investment daily for 10 years.

FIGURE 8.2

Nominal 10-Year Treasury Yield Decomposition, January 2018–July 2021



Source: D'Amico, Kim, and Wei 2018; Haver n.d.; authors' calculations.

Note: Decomposition produced with the D'Amico, Kim and Wei (DKW 2018) model.

THE
HAMILTON
PROJECT



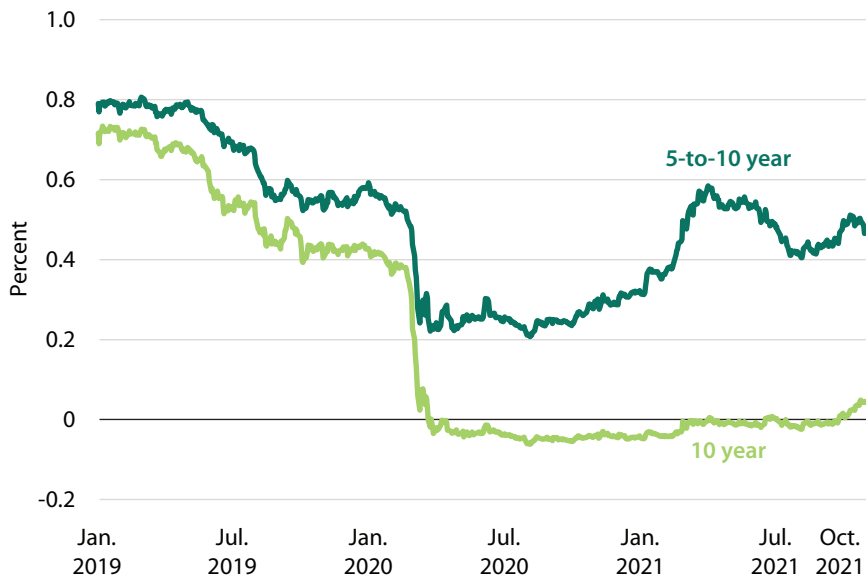
Hutchins Center
on Fiscal & Monetary Policy
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boosting the 10-year yield. If the FOMC were expected to raise rates further to fight inflation, those expectations would take the 10-year yield higher. As of this writing, the market expects much of the recent inflation rise to be temporary and expects the Fed rate-raising cycle to be relatively modest. That expectation is likely at least in part due to lingering concerns about growth; as a result, the contribution of expected real rates remains low.

The remaining component is the term premium. This is the additional compensation to investors for holding a longer-dated bond relative to what they would receive continually rolling over shorter-dated bonds. Risk can arise from that extra duration; here, “duration” is a term for the interest rate sensitivity of longer-dated bonds compared to shorter-dated bonds. Term premium is the component of yields influenced by portfolio choices, longer-term default risk, and supply (Treasury issuance) and demand (from domestic and foreign investors). In theory, term premium is the component most influenced by the Fed’s LSAPs. Despite trillions of dollars of Fed purchases, the term premium today is no lower than it was pre-pandemic. Despite trillions of dollars of added

FIGURE 8.3

Expected Average Future Real Short Rate



Source: D'Amico, Kim, and Wei 2018; Haver n.d.; authors' calculations.

Note: Data produced with the D'Amico, Kim and Wei (DKW) model.

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government debt, it is not much higher, either. The Fed purchases could be offsetting some of the increase in term premium that would have otherwise occurred due to the substantial increase in Treasury supply.

Another important reason U.S. government bond yields remain low is that markets continue to think neutral interest rates are low. In Figure 8.3 we take the future path of the real short rate (policy rate) contribution to the 10-year yield and pull out the second five years: the expected real policy rate for the five-year rate five years from now. That five-year implied rate five years from now is far enough forward to assume that monetary policy will return the economy to a steady state, or equilibrium. Financial markets continue to see that forward rate five years from now as low, and in fact lower than pre-pandemic, despite the rise in debt-to-GDP, which would have been expected to put upward pressure on neutral rates. But neutral rates are also determined by other forces, such as potential economic growth in the future, demographics, and structural imbalances in savings and investment that investors expect

will persist.²² Thus far, financial markets expect the low structure of rates to persist, which would help to keep government debt service manageable and suggests that the large fiscal response has been well absorbed. The jury is still out, however. A very important unknown is how real neutral rates evolve in the coming years, especially once COVID-19 is truly over.²³

Quantitative Easing and Debt Issuance: Monetary Fiscal Coordination

“The problem with QE is it works in practice, but it doesn’t work in theory.”

—Ben Bernanke, January 16, 2014

When the Fed buys a Treasury bond, the seller is credited with reserves. Reserves are an instant demand obligation of the federal government, just like currency. This is why some argue that the Fed has monetized the debt. A cash-like equivalent, reserves are used in the interbank system to settle payments and can be converted to vault cash. Increasing the currency in circulation drains reserves. If an individual walks into a bank and withdraws cash, they are converting the reserves of the bank, held on deposit at the Fed, into currency. But through another lens, the Fed’s purchase of a Treasury bond is simply a maturity transformation, rather than monetization. If we consider the Treasury and Fed on a consolidated government balance sheet, buying a Treasury bond by creating reserves simply exchanges a longer-term government obligation for an instant government obligation. The Fed pays interest to the banks on their reserve balances. Thus, in a consolidated form, the federal government swapped paying interest on Treasury debt for paying interest on reserves.

However, the Fed can adjust its balance sheet quickly, as it did during the pandemic. It can increase reserves rapidly with likely less disruption than if the Treasury decided to suddenly shift to issuing very short-dated bills so quickly. (More reserves apply downward pressure on overnight borrowing rates

22. As Ferreira and Shousha (2021) note, expanded government debt should push up neutral rates, but those effects can be mitigated by institutions like central banks that restrict the supply of that debt to market participants.

23. Financial markets inferred a decline of neutral rates in the year leading up to the pandemic. That coincided with FOMC’s own reassessment. According to the FOMC’s quarterly Summary of Economic Projections, the longer-run nominal funds rate declined from 3.0 percent to 2.5 percent during 2019. That 2.5 percent longer-run nominal assessment of the FOMC was roughly similar to the 0.5 percent to 0.6 percent five-year forward real short rate estimate shown in Figure 8.3. Adding the FOMC’s inflation target of 2.0 percent brings that estimate close to the 2.5 percent seen in the Summary of Economic Projections. The 5-to-10 year forward real short rate (five years forward) is lower now than pre-pandemic by about 10 bps.

while more bill issuance applies upward pressure.) Also, the surplus earnings from interest and principal on the bonds held at the Fed are remitted back to the Treasury. Now, as interest rates rise to ward off inflation, higher rates of interest will be paid on the reserves. But still, remittances from the Fed's asset holdings have become a meaningful source of Treasury revenue. In 2019, when the post-GFC Fed balance sheet shrinking had ended and the Fed had been raising interest rates, the Fed remitted \$55 billion to the Treasury.²⁴

With LSAPs, in the short run the Fed has removed the Treasury debt from trading in the bond market without replacing it with anything that trades in bond markets. Reserves are essentially restricted to the domestic banking system. The Fed purchases also removed longer-run securities from private hands and replaced them with an instant obligation—reserves—the interest on which tends to be lower than the longer-run yields paid on the debt the Fed purchased.²⁵ By removing longer-duration bonds (including agency MBS) the asset purchases put downward pressure on longer-run yields. Reducing the supply puts upward pressure on bond prices and downward pressure on bond yields determined by trading in private markets. That is one of the monetary policy-easing effects of QE.

In the long run, the estimated downward pressure on interest rates from the LSAPs diminishes. Part of the easing value might come from signaling the central bank's intention to keep rates low, which erodes as policy rate increases approach. The Fed may eventually allow the bonds that were purchased to mature without purchasing replacement bonds, which would remove or drain the reserves from the banking system, and put the debt back into the hands of the private sector. If the Fed tried to maintain the size of its balance sheet relative to GDP, and rolled over its bond purchases forever, such actions would, all else equal, keep monetary policy accommodative, and would, at some point, require tighter monetary policy along some other margin to keep inflation in check. Thus, in theory it is hard to see why QE would permanently lead to lower interest rates.

24. Note that when reserves rose, currency in circulation, which drains reserves, also rose. While that may not be a first-order effect of LSAPs, currency drains reserves, replacing obligations that the government pays interest on (bonds and reserves) with an obligation the government pays zero interest on (dollar bills or Federal Reserve notes). Currency growth accelerated with the monetary and fiscal policy response, rising 21 percent (nearly \$400 billion) over the six quarters ending the second quarter of 2021, and draining the equivalent amount of reserves. That is almost 2 percent of nominal GDP, which we would argue is not trivial, and on which the government pays no interest.

25. Obviously, this changes as interest rates rise. The Fed could also see the value of its holdings fall as the price of those holdings declines. However, given an upward sloping yield curve, in the short run, as would be the case early in an economic recovery, the Treasury would earn the spread between the interest paid on reserve balances and the interest earned on longer-term Treasury bonds and agency MBS, since the interest rate paid would be lower than the interest rates received. As noted in the example in the text, in the years following the GFC, the Fed remittances were a meaningful annual source of revenue for the Treasury. See Bernanke (2017) for additional discussion.

TABLE 8.2

Estimates of the Impact of Central Bank Asset Purchases on the 10-Year Treasury Yield in Basis Points

Study	Sample	Decline in 10-Year Yield Following a 1% Increase in Central Bank Asset Purchases
Modigliani-Sutch (1966, 1967)	Operation Twist	0 bp
Bernanke-Reinhart-Sack (2004)	United States	10 bp
Greenwood-Vayanos (2008)	Post-war United States (pre-crisis)	4 bp
Gagnon-Raskin-Remache-Sack (2011)	LSAP1	5 – 8 bp
Hamilton-Wu (2011)	U.S., 1990–LSAP2	4 bp
Hancock-Passmore (2011)	LSAP1 MBS purchases	8 bp
Swanson (2011)	Operation Twist	4 bp
Krishnamurthy–Vissing-Jorgensen (2011, 2012)	Postwar U.S., LSAP1, and LSAP2	4 bp
Christensen-Rudebusch (2012)	LSAP1, LSAP2, and U.K. LSAPs	2.5 bp
D’Amico et al. (2012)	United States, pre-crisis	11 bp
Neely (2013)	Effect of U.S. LSAP1 on foreign bond yields	4 bp
Bauer-Rudebusch (2013)	LSAP1, LSAP2	4 bp
Li-Wei (2013)	United States, pre-crisis	6 bp
Goldman Sachs (2013)	QE1, QE2	4 bp
D’Amico-King (2013)	LSAP1 Treasury purchases	25 bp
Goldman Sachs (2017)	QE1, QE2	4 bp
Kim-Laubach-Wei (2020)	United States (1990-2015)	12m: 4 bp; 24m: 0 bp
Goldman Sachs (2021)	COVID-19	4 bp
Brooks-Pingle (2021)	United States (1984-2021)	4 bp

Source: Adapted from Williams 2014; select authors.



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But, in the short run, there is a broad consensus among empirical studies in the academic literature that LSAP programs temporarily depress longer-term yields, with a few exceptions. Williams (2014) in a survey of the early literature found that \$600 billion in LSAPs lowers the 10-year yield by 15–25 bps. We supplement the table from that presentation with other estimates (Table 8.2). Subsequent studies, including Hamilton (2018), have argued that early studies overstated the effect of QE on yields, because the novelty of LSAPs has worn off since QE1 was announced in March 2009, with markets less responsive to subsequent QE programs. Over time, consensus appears to have settled on an

estimate that, for every percentage point of nominal GDP in LSAPs, the 10-year Treasury bond yield is reduced by roughly 4 bps.²⁶

To translate these estimates to the current episode, as of March 2022 the Fed will have bought more than \$3.2 trillion in Treasury bonds, notes, and inflation-indexed Treasuries. That represents 15 percent of nominal GDP. The estimate of a little more than a 4 bp fall in rates for every percentage point of GDP increase in Fed purchases implies that the current level of the 10-year yield is around 70 bps lower than it would have been in the absence of QE; in other words, instead of, say, 1.5 percent, it would be around 2.2 percent. That counterfactual comes with many caveats.

As we described, QE amounts to a maturity transformation, with the Fed buying government bonds and in exchange issuing reserves, a short-term liability. Some argue removing duration should not matter much since reserves, a short-term obligation, are being issued instead, and the Fed holdings of longer-run debt are only temporary. Others argue that QE is rooted in the preferred habitat view of financial markets, whereby the Fed crowds investors out of bonds at longer maturities with the goal of pushing them into holding riskier assets. Or some argue simply that the demand for longer-dated Treasury bonds as a hedge in many portfolios creates a portfolio role with limited substitutes, and that reducing the supply pushes up the price.

The estimate could be too large. In addition to the theoretical arguments, many studies finding large effects are event studies from QE1; those event studies had a larger effect than subsequent QE programs. Second, as Fabo et al. (2021) argue, much of the discussion around the effects of QE might come down to a matter of perspective, with central bank studies finding generally larger effects than outside studies. Third, as Greenlaw et al. (2018) show, there is little evidence that QE influences yields over longer horizons, beyond the very near-term impact on markets.

However, the 4 bps estimate could be too low, too. First, investor expectations today likely foresee more of the Fed purchases of Treasuries as permanent additions to the Fed balance sheet than was the case for the QE following the GFC. Immediately following the GFC the Fed's guidance indicated the balance sheet would return to the minimum size necessary, which many expected to be a full return to precrisis size. In the end, the FOMC was able to reduce its balance sheet by only a small fraction of what was expected, less than \$700 billion; that reduction ended in 2019, also sooner than many expected. Second, our estimated effect of 70 bps may be too small because it does not incorporate any impact for the removal of agency MBS, which is a close substitute in many portfolios. As a longer-dated asset, the agency MBS purchases amounted to a material amount of 10-year Treasury equivalents.

26. For a summary of a wide range of empirical estimates and Treasury market analysis, see Goldman Sachs 2021.

TABLE 8.3

Estimates of the Impact of Fiscal Expansions on the Real Interest Rate in Basis Points

Study	Sample	Impact of 1 Percentage Point Increase in the Deficit-to-GDP Ratio	Impact of 1 Percentage Point Increase in the Debt-to-GDP Ratio
Gale-Orszag (2003)	U.S.	50–100 bp	N/A
Brook (2003)	Advanced economies	20–40 bp	1–6 bp
Engen-Hubbard (2004)	U.S.	18 bp	3 bp
Federal Reserve Board (2018)	U.S.	40–50 bp	N/A
Faini (2006)	Euro area	40 bp	N/A
Kinoshita (2006)	19 OECD economies	N/A	4–5 bp
Laubach (2009)	U.S.	20–30 bp	3–4 bp
Seliski-Gamber (2019)	U.S.	N/A	2–3 bp
Tedeschi (2019)	U.S.	18 bp	4.2 bp
Rachel-Summers (2019)	Review	40 bp	3.5 bp

Source: Select authors; please see the references for this chapter for additional details.



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The Impact of Rising Debt on Yields

Larger budget deficits and rising public debt should put upward pressure on interest rates. Conceptually consistent with standard macro models, higher debt issuance competes for available savings with other sectors of the economy, leading to a rise in real interest rates and potentially crowding out private investment in the process.²⁷ In Table 8.3 we summarize several estimates from the academic literature on the impact of fiscal expansion on yields. Rachel and Summers (2019), in a survey of the literature, find that a rise of 1 percentage point in the ratio of debt-to-GDP is associated with an increase in yields of around 3.5 bps. They also note that these estimates could understate the magnitude of fiscal expansions on real rates because the fiscal stance is measured with error. They argue this is because international capital flows, which will gravitate to where there is upward pressure on real rates, will tend to mitigate the rise due to more debt. Also, the countercyclical nature of fiscal policy means that low real rates will tend to coincide with expansionary fiscal policy.

27. See also: Warnock & Warnock (2009)

These elasticities imply that the sharp rise in public debt due to the pandemic response should have exerted considerable upward pressure on real interest rates. Working with the Rachel and Summers (2019) elasticity of 3.5 bps for every percentage point rise in debt-to-GDP, the roughly 20-percentage-point rise in public debt since the end of 2019 equates to around 70 bps on the 10-year Treasury yield. That happens to be almost the same order of magnitude as the downward effect on real rates from LSAP by the Fed. Altogether it could be that the 20-percentage-point rise in debt-to-GDP raised the neutral rate of interest in the United States, while the Fed's LSAPs and the ongoing pandemic have potentially concealed that effect in the short run. That would help explain why estimates of term premia have been so little changed, despite previously unimaginable central bank purchases and the largest peacetime fiscal expansion in the nation's history. Of course, the rise in private savings, lower investment demand, and the ongoing pandemic are all forces that could continue to hold down yields, too.

Beyond Today: We Are Still Running This Experiment

The longer-term effects on interest rates from this experiment in extraordinary fiscal and monetary policy are uncertain. As we note above, financial market pricing implies rates are expected to remain relatively low in the coming years. Nonetheless, as of mid-March 2022, the 10-year Treasury yield is up from its lows in 2020 and there are reasons to expect that it may continue to rise as a result of developments over the past two years. According to the estimates we just described, the increase in government borrowing is probably already putting upward pressure on interest rates, as the federal government competes with the private market for resources. However, some of that upward pressure on rates from crowding out private investment could be still to come.

Plus, interest rates have likely been held down somewhat by fears that the pandemic will usher in a period of weak long-term economic growth. Those fears, and the degree to which they have partly gone away, were probably one factor that led to the steep reduction in rates in 2020 and to the partial recovery since then. Yields could continue to move higher, and even potentially move higher than financial markets expect, if the fear of COVID's lingering economic impact continues to fade. What happens to interest rates also depends on what happens to inflation and inflation expectations. Inflation in March 2022 was at multi-decade highs. The recovery has been very strong and there is a sizable risk that the U.S. economy is genuinely overheating. If inflation expectations increase, nominal rates after the pandemic could end up permanently higher than would have been expected prior to the pandemic.

Although any decline in household savings in the United States may put upward pressure on interest rates, the change in composition of that savings

we argue will probably have only muted effects. Much of the large increase in savings in the United States over the past two years shifted into short-term liquid money market deposits that hold short-dated government debt. Even though those deposits may fall over time, the somewhat closed nature of the system of the U.S. banking system should mitigate some of the effects of the changing composition of deposits on Treasury yields.²⁸ However, the large stock of saving could be adding to the imbalance between saving and investment that we mention above may be one reason real neutral rates are low. We made the point that market-implied pricing suggests real neutral rates remain low and are expected to remain low in the coming years, but no one can be sure. The massive increase in Treasury issuance (as well as government debt in other countries) could be getting closer to satiating private investors' demand for safe assets, which for years has likely put downward pressure on government debt yields relative to other interest rates. In other words, the recent increase in global sovereign debt may mean that the neutral rate going forward could be higher than it was before the pandemic.²⁹

The downward pressure on long-term interest rates from LSAPs should lessen over time too. Even if the Fed does not shrink its balance sheet, as the economy grows the Fed's balance sheet as a share of GDP would shrink. In addition, to the extent that LSAPs lower interest rates because of preferred habitats, the effects should fade over time as differences in yields across different types of assets are arbitrated away. Also, the Fed has signaled that it will reduce the size of its balance sheet over time. If removing the stock of longer-dated Treasury bonds from private markets put downward pressure on interest rates, returning that debt to private markets should put upward pressure on longer-term interest rates.³⁰ How this all evolves is unclear. The GFC also brought about a steep increase in federal borrowing and accommodative monetary policy. Yet, in the subsequent decade, the 10-year Treasury yield remained below the levels of 2006 and 2007. That previous period, however, might not be a good guide for this crisis.

28. One household's payment for a good or service ends up being a counterparty's deposit. Or a reduction in deposits at a bank could end up as a deposit in a money market fund. While that may change the duration of the debt held by money market funds and banks together, the shift in deposits seems unlikely to meaningfully alter overall demand for Treasury debt.

29. In addition, for U.S. holders of Treasuries in particular, new regulations, a move to clearinghouse trading for government bonds, and new standing repurchase facilities at the Fed could all affect the decisions to hold government debt.

30. Note that the impact on private bond markets of the Federal Reserve reducing its holdings of Treasury bond securities, and the return of that issuance to private markets, depends on the U.S. Treasury Department too. In early 2022 the Treasury has been reducing the auction sizes of longer-term government debt. Should the Treasury issue less longer-term debt and more short-dated bills, that would likely offset some of the upward pressure on longer-term yields from the Federal Reserve's reductions of its Treasury holdings.

Is This Repeatable?

Two distinguishing features of the fiscal response were the size and the speed. Debt held by the public (including the Fed) expanded nearly \$5 trillion (by about 20 percent of GDP) in just 12 months.³¹ Could that have been accomplished without the Fed purchasing trillions of dollars of that debt at the same time? We have no counterfactual, but we suspect that, without the Fed's large purchases during the pandemic, the Treasury would probably not have been able to issue so much debt so quickly, and at such low interest rates. Indeed, market dislocation very well could have emerged without the Fed.

Considering the speed and size of debt funded at the low pandemic yields, and who did and did not help absorb the debt issued, leads us to emphasize the importance of the Fed in facilitating the fiscal response to the pandemic. The Fed purchases as of this writing are approaching two-thirds of the increase in debt held by the public since the pandemic's onset. Most of the rest of the private sector buyer base in the first year of the pandemic, aside from money market mutual funds, did not absorb the Treasury debt issuance to the same extent as they did following the GFC. Perhaps it is no coincidence that, in the past 100 years, the two largest U.S. fiscal expansions, World War II and the COVID-19 pandemic, occurred with the Fed playing a meaningful role in putting downward pressure on U.S. yields on bonds of longer maturities and not just downward pressure on overnight interest rates. In both episodes, the Fed helped keep yields low for at least the period in which the Treasury needed to access private markets and finance a large increase in government debt.

How often can the Fed do this? As often as necessary, we hope.³² What is the ultimate limit? Inflation is the important limiting factor of the central bank's ability to facilitate such large debt issuance. Recall the earlier point that, if the central bank wanted to maintain its balance sheet size relative to GDP permanently, monetary policy would have remained accommodative, and eventually another margin of policy would need to be tightened to avoid sparking inflation. Thus, because of the need to tighten policy to prevent inflation, bonds cannot be simply added to the Fed's balance sheet with interest paid on reserves kept low, in perpetuity.

In addition, inflation risks the power of the Fed and fiscal sustainability. Although inflation reduces debt burdens in real terms, it creates costs, too, and would erode the value of the dollar as a reserve currency.³³ Inflation erodes central bank credibility. Say the central bank needs to provide accommodation or purchase assets to address a crisis; high inflation and the risk of

31. Debt held by the public rose \$4.3 trillion in the 12 months ending February 2021, representing 19.8 percent of fourth quarter of 2019 nominal GDP.

32. In a recent paper, Ricardo Reis (2017) walks through in some detail the limits of a central bank issuing reserves to purchase the sovereign's debt.

33. See Hilscher, Raviv, and Reis (2014).

inflation rising further could prevent the central bank from providing sufficient accommodation to assist the real economy and to hold down interest rates in the wake of an increase in federal borrowing. Instead, the central bank would need to raise nominal and real interest rates to push down inflation. Recall former Fed Chair Paul Volcker: raising interest rates and recession were a necessary cure for the high inflation of the 1970s. The longer-run debt outlook for the United States is dependent on interest rates. Higher real rates to bring inflation down would raise the costs of debt service and slow economic growth. A credible central bank that keeps inflation near target can provide accommodation quickly and when needed, and keep longer-term inflation expectations anchored.

Hence, the independence of the central bank is crucial. The inflation-fighting credibility, something former Federal Reserve vice chair Don Kohn once described as hard-won credibility, is crucial, too. Looking across central banks whose balance sheets have been able to expand substantially, the European Central Bank and the Bank of Japan both have independence and credibility for maintaining low inflation, by choice or by historical record. With a garden variety demand-shock, inflationary pressures fall and the Fed lowers rates to spur demand. In another supply-driven recession, we might again find ourselves with inflationary pressure and low employment, a tension in the goals of the central bank. In either type of recession, however, if inflation expectations are easily unanchored and risk rising, the central bank might need to prioritize pushing inflation expectations back down rather than supporting demand in the near term. Should expansive LSAPs in response to one recession prove inflationary, inflation expectations in the next episode might move too high at the prospect of future LSAPs. Higher inflation expectations at the start of a downturn may lower real interest rates and thus support demand, but unanchored inflation expectations that subsequently need to be pushed lower would be harmful in the long run.

Considering our ability to respond to future crises, the fiscal response to the pandemic was helped by low yields and also, we argue, was helped by the Fed. To repeat the response requires yields to remain low, unthreatened by the fiscal outlook, and the Fed needs to retain its inflation-fighting credibility. Currently, that credibility remains in place, but inflation also sits at post-1980s highs. Should the high inflation prove persistent, then the lessons learned from this episode will look very different and suggest that the responses, both fiscal and monetary, were perhaps too much or ill-conceived. Inflation could also limit the ability of the Fed to facilitate a large fiscal response to the next crisis. As of mid-March 2022, projections are that the elevated inflation will move lower over time, and also that neutral rates will remain low.

Concluding Remarks: Lessons Learned

The swiftness and severity of the COVID-19 shock presented policymakers with unprecedented challenges. The pandemic is not over, and a lot of its history remains to be written. Here we draw several conclusions.

First, the Fed—by way of very large emergency QE—was able to restore order to the Treasury market sell-off in March 2020. In the space of seven weeks in March and April that year, the Fed bought \$1.45 trillion in Treasury securities, a staggering amount, which stabilized the market and ensured smooth functioning. In the aftermath of that demonstration, markets have little doubt that the Fed is willing to do whatever it takes to maintain orderly functioning in the Treasury market, which is an important signal. Through subsequent ups and downs of the COVID-19 pandemic, functioning in the Treasury market has been smooth. Orderly market functioning for U.S. government debt is a prerequisite for U.S. Treasury issuance to finance fiscal stimulus.³⁴

Second, the large-scale fiscal stimulus required historic budget deficits and debt issuance on short notice, which was facilitated by the Fed. Markets accepted this novel monetary–fiscal cooperation without a tantrum, even in the face of rising inflation fears. Government bond yields remain near pre-pandemic levels and the dollar’s value is strong: both of these facts show the power of the Fed. This power is the exorbitant privilege of the United States. On the surface, this power also suggests that the ability to fund large fiscal deficits without adverse consequences is vast and suggests that policy space should remain ample at the current juncture. Nevertheless, how inflation unfolds in the coming years is an important concern.

Third, the ability to expand the deficit that much and that fast should not be taken for granted. Looking at who bought Treasury debt when it needed to be bought in large quantities, some traditional buyers such as overseas investors and many types of domestic investors without a regulatory incentive failed to absorb as much as they have in the past. As of early 2022, the United States’ ability to fund its budget and trade deficits looks ample, and the dollar remains strong. However, in running this experiment, those margins were not stressed, in part because the central bank could quickly shift and adjust its expansive balance sheet and issue reserves to help accommodate the fiscal response.

Still, many questions will need to be settled in coming years. Where the 10-year yield lands once the COVID-19 crisis is truly over is an open question. While yields are currently low in mid-March 2022, an end to the pandemic could send yields higher. Just because the dollar is strong as of this writing and the current low level of yields looks enticing does not mean that either will be so on a longer-term horizon. In addition, concerns around overheating of the U.S. economy and inflation are front and center. Not only could such overheating send yields higher, but it could also limit a future crisis response.

34. Reis (2022a; 2022b).

As a result, it is too soon to say with confidence how many times the United States can afford to repeat this policy experiment. We have been lucky that it has been successful thus far during COVID-19, but we should use caution in extrapolating too far into the future in terms of policy implications and lessons.

Finally, we argue that an important lesson has been confirming the crucial importance of defending an independent and credible central bank in the Federal Reserve. After all, unprecedented policy activism has coincided with a strong U.S. dollar, low yields, and little market concern over the longer-run inflationary fallout from our policies. This is likely due to the independence of the Federal Reserve, which—even with the recent rise in inflation—is keeping longer-run inflation expectations anchored, so far.

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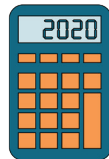
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Lessons Learned from the Use of Nontraditional Data during COVID-19

Tomaz Cajner, Laura Feiveson, Christopher Kurz, and Stacey Tevlin¹

Introduction

Over the last decade, an explosion of data collection has led to a robust set of nontraditional data sources for both monetary and fiscal policymakers to incorporate into their decision-making. In normal times, existing and time-tested datasets compiled by government statistical agencies often do a good job of capturing the evolution of the economy at a monthly or quarterly frequency accurately and without bias. However, when the economy turns quickly—times when policymakers need to be particularly responsive—nontraditional data sources may be able to fill important gaps. The COVID-19 crisis provided a test case of the usefulness of these alternative data sources. In this chapter, we explore how nontraditional data sources aided—or, in some cases, did not aid—policy decision-making during the pandemic recession and what lessons we can learn for future crises.

We organize the chapter around examples that highlight the three main potential benefits of nontraditional data sources relative to their government counterparts. The first possible benefit we call *timely measurement* of the economy, meaning the use of nontraditional datasets to learn in close to real time

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about aggregate developments in the economy that will be reflected only later in statistics released by the government. We argue that the benefit of such timely measurement is important to policymakers, especially in times of sharp contractions, such as March 2020.

The second benefit that we highlight is *granularity*, that is, that due to their nature some nontraditional data sources may provide reads on aspects of firm or consumer behavior for which there is no standard government data source (even with a lag). The finer granularity could be related to frequency (e.g., daily data), geography (e.g., data broken down by region), or individual characteristics. Generally, being able to do granular analyses in almost real time could allow for faster evaluations of the costs of shocks or the benefits of policies, which in turn could serve to fine-tune subsequent policy actions.

The final benefit of nontraditional data that we discuss is *crisis-specific data gathering*. The availability of data from so many different sources allows policymakers to answer specific, unanticipated questions that are unique to a particular crisis. For these unique uses, it is not clear that investment in generating these statistics during normal times would be even worth the cost, underscoring the importance of quick access in times when they are.

The last section dives into the pitfalls of nontraditional data and how we can learn from what did not go well in their use during the COVID-19 crisis. Unlike government statistics, most alternative data sources are not designed with the purpose of generating statistics but are instead a byproduct of another use (such as card transactions). As such, the data are not designed to be representative of consumers or firms and may be hard to interpret or, worse, misleading. It is from these pitfalls that we take some of the most useful lessons of where effort is needed to be ready for the next crisis.

To assist in the discussions of measurement, granularity, data gathering, and pitfalls, we compiled a summary table at the end of this chapter of examples of nontraditional data sources that would have been available to policymakers during this crisis (Table 9.1). The table, while certainly not exhaustive, contains a list of indicators from five categories, covering spending and consumer confidence, employment, health, mobility, and “other.”

Timely Measurement of the Economy

We start by considering how the timely measurement benefit of nontraditional data may have influenced both monetary and fiscal policy decisions in the spring of 2020—a time of historically acute economic change. As Figure 9.1 shows, as events rapidly unfolded, many critical policy decisions were made before the release of any government data. In fact, the Federal Reserve’s (Fed) emergency rate cuts, resumption of large-scale asset purchases, announcement of new facilities, and Congress’ passage of the Coronavirus Aid, Relief, and Economic Security Act (CARES Act) came before any government data containing sign of the downturn were released. As we describe below, nontraditional data sources were likely essential in guiding the writing of policy during the latter part of this period.

TABLE 9.1

Summary Table of High Frequency Indicators

High-Frequency Indicator	Indicator	Length of Time Series	Frequency	Standard Statistics Analog	Other Information	Additional Granularity by
1. Spending and Consumer Confidence Indicators						
Affinity	Consumer spending	2020–present	Daily	Census Retail Sales; BEA PCE	Card data from Opportunity Insights	Geography; industry; income
BoxOfficeMojo	Movie spending	1977–present	Weekly	Census QSS; BEA NIPAs		Country
Fiserv	Consumer spending	2010–present	Daily	Census Retail Sales; BEA PCE	formerly First Data	Industry; state
JD Power	Motor vehicle sales	2002–present	Weekly	Wards Light Vehicle Sales; BEA PCE		
MorningConsult	Consumer confidence	2018–present	Daily	Michigan Survey		Future/current conditions; state
NPD	Consumer spending	2020–present	Weekly	Census Retail Sales; BEA PCE		Geography; spending category
OpenTable reservations	Restaurant spending	2020–present	Daily	Census QSS; BEA NIPAs		City
Ramussen	Consumer confidence	2004–present	Daily	Michigan Survey		
Redfin	Home sales	2017–present	Weekly	Census New Home Sales; NAR Existing Home Sales		Pending and existing sales
Smith Travel Research	Hotel spending	2020–present	Weekly	Census QSS; BEA NIPAs		City; state
Womply	Small business revenue	2020–present	Daily	n/a	Businesses open	Sectors
2. Employment Indicators						
ADP-FRB	Payrolls; wages; business exit	2002–present	Weekly	BLS Current Employment Statistics	Can measure business exit	Industry; state
Homebase	Payrolls; hours worked	2020–present	Daily	BLS Current Employment Statistics	Businesses open; Can measure percent change since February 2020.	Small business
Burning Glass	Job postings	2020–present	Weekly	BLS JOLTS		Industry; demographics
Indeed	Job postings	2018–present	Daily	BLS JOLTS		
Census Household Pulse	Employment	2020–present	Weekly	BLS Current Employment Statistics		Industry; demographics

(continued)

TABLE 9.1 (CONTINUED)

Summary Table of High Frequency Indicators

High-Frequency Indicator	Indicator	Length of Time Series	Frequency	Standard Statistics Analog	Other Information	Additional Granularity by
Federal Reserve Bank of Dallas Real-Time Population Survey	Employment	2020–present	Weekly	BLS Current Employment Statistics		
Yale Labor Survey	Employment	2020–2021	Weekly	BLS Current Employment Statistics		
3. Health Indicators						
Covid Tracking Data	Hospitalization; testing	2020–2021	Daily	n/a		State
Department of Health and Human Services	Cases; deaths; hospitalizations; testing	2020–present	Daily	n/a		Demographics
Johns Hopkins University	Cases; deaths	2020–present	Daily	n/a		County
National Public Radio	Contact tracing	2020–2021	Weekly	n/a		State
New York Times	Cases; deaths	2020–present	Daily	n/a		County
4. Mobility Indicators						
Apple Mobility	Mobility	2020–present	Daily	n/a	Index of activity from navigation requests	Location
Descartes Labs	Mobility	2020–2021	Daily	n/a	Index of distance travelled based on smartphone GPS location devices	Location
Flightstats	Spending; travel	2020–present	Daily	n/a	Flight cancellations	Airport
Google Mobility	Mobility	2020–present	Daily	n/a	Visits to select destinations	Sectors
Metropolitan Transit Authority	Mobility	2011–present	Weekly	n/a	MTA turnstiles	Location
Safegraph	Spending; mobility	2018–present	Daily	Census Retail Sales; BEA PCE	Share staying at home	Location; industry
Safegraph	Business exit	2018–present	Daily	Census Business Dynamic Statistics; BLS Business Employment Dynamics	Inactivity at business location	Location; industry
Transportation Security Administration	Spending; travel	2019–present	Daily	Census QSS; BEA NIPAs	Airport passenger departures	

(continued)

TABLE 9.1 (CONTINUED)

Summary Table of High Frequency Indicators

High-Frequency Indicator	Indicator	Length of Time Series	Frequency	Standard Statistics Analog	Other Information	Additional Granularity by
The Eviction Lab, Princeton University	Evictions	2020–present	Weekly	n/a		
Weekly Business Formation Statistics (BFS)	Business formation	2005–present	Weekly	Quarterly BFS	EIN applications with information on business formation	Industry; region; state

Note: “n/a” implies there is no applicable official analog of the HFI data.



However, it is also worth noting that the nontraditional data could not have possibly filled the entire information vacuum since some of the very first policy actions were necessarily taken before there was any material effect on the economy at all. In particular, the Fed’s emergency rate cuts were made in early and mid-March, before there was a U.S. lockdown, and the discussions about facilities and the CARES Act were underway before the effects of COVID-19 had taken hold of the U.S. economy. During these times, policymakers mostly relied on nongovernment sources to guide these initial actions—financial movements and news of shutdowns in China and Italy—as well as on analysis by epidemiologists regarding the likely spread of COVID-19, along with calibrations by economists on the resulting impact on the economy.² This can be seen from the minutes of the Federal Open Market Committee (FOMC)’s videoconference meeting on March 2nd, which cited that “the virus was at an earlier stage in the United States and its effects were not yet visible in monthly economic indicators, although there had been some softening in daily sentiment indexes and travel-related transactions.”³

Still, once the pandemic did take hold in the U.S., nontraditional data sources filled in a crucial gap in corroborating the enormous effects of the pandemic on employment and on spending before official statistics were released.

Figure 9.2 shows how the use of ADP-FRB employment data from a large payroll processor—cleaned and refined by economists at the Federal Reserve Board—revealed the labor market damage in real time.⁴ The Bureau of Labor

2. For example, in the first half of March, the near-complete shutdowns of motor vehicle production in Italy and Spain, and lower production rates in Germany and France, provided guidance for forecasts of domestic light motor vehicle production.

3. See FOMC (2020). Both Rasmussen and Morning Consult indexes of consumer sentiment had softened at the end of February. Similarly, hotel occupancy and restaurant reservations were moving down at the start of March.

4. The ADP-FRB data were available in real time to policymakers in the Federal Reserve System. For more details, see Cajner et al. (2018, 2020a, 2022). The ADP data contain two measures

FIGURE 9.1

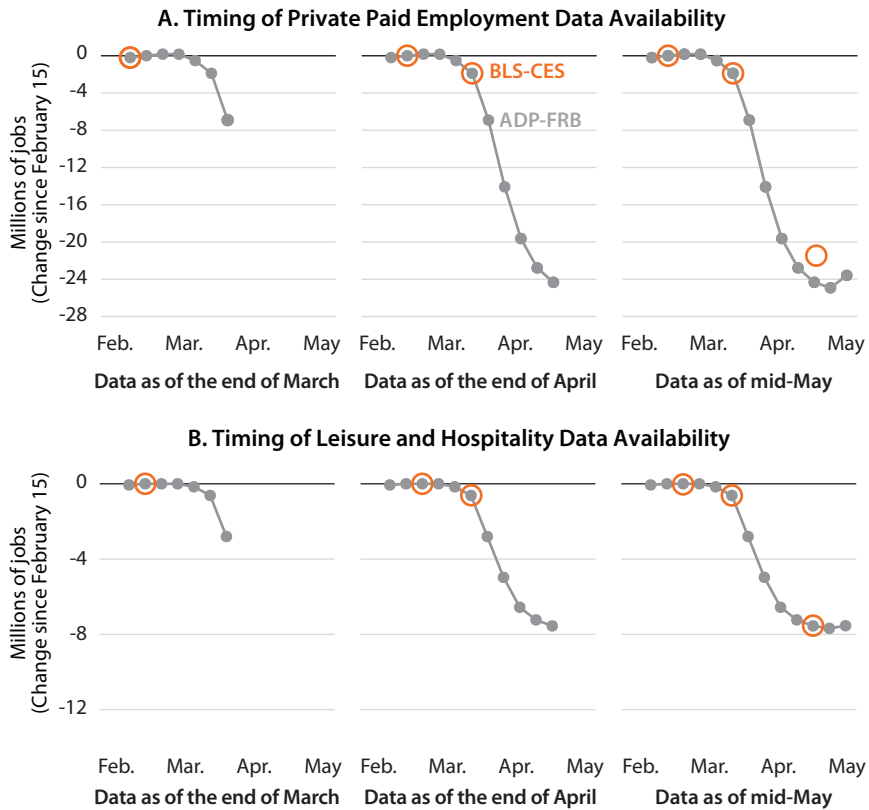
Timeline of Data Releases and Early Policy Responses to COVID-19, January to July 2020



Source: BEA 2020; BLS 2020; Census Bureau 2020a–c; Center for Disease Control and Prevention 2020; Congress 2020; Department of Labor 2020; Department of the Treasury 2020; Federal Reserve Board 2020; Reuters 2020.

FIGURE 9.2

Snapshots of Employment Data in 2020



Source: ADP, Inc. 2020, Bureau of Labor Statistics BLS n.d.; authors' calculations.

Note: For ADP-FRB, paid employment concept is plotted.



Statistics (BLS) report released at the beginning of April only covered the week including March 12th and did not reflect these declines. It was not until the beginning of May that these employment losses were visible in official

of business-level employment. The first, referred to as “paid” employment, measures the number of employees issued a paycheck by an ADP client in each pay period. The second, referred to as “active” employment, measures the number of employees in employer payroll databases. At the height of the pandemic, the ADP-FRB indexes based on paid employment were extremely useful for studying short-term temporary job dislocation.

estimates.⁵ In contrast, by the end of March and the beginning of April, when the final Fed facilities were decided upon and announced, policymakers with access to the ADP-FRB data could already see the staggering amount of job loss occurring, driven in large part by employment declines in the leisure and hospitality sector.⁶

Note that the ADP-FRB data for a given week are available with a lag of about one week, which translates into learning information about the week of the BLS Current Employment Statistics survey about two weeks before the BLS releases its data. Even by the end of March, it was apparent that private paid employment was declining sharply. By the end of April, the ADP-FRB data clearly portrayed an unprecedented collapse. These readings from the ADP-FRB data were available well before the official BLS publication dates and proved quite accurate in portraying the scale of the employment devastation.

The nontraditional data on consumer spending filled in a similar gap. Figure 9.3 shows some of the spending data that were in hand at three snapshots in time: the end of March, mid-April, and mid-May. The high-frequency data shown are retail sales data derived from Fiserv card swipe data, restaurant reservations from OpenTable, and airport departures from the Transportation Security Administration.⁷ The Census series shown are monthly and released two weeks after a month's end. Like the ADP-FRB data, the nontraditional spending data were able to capture the severe downturn in spending in COVID-sensitive categories by the time policy decisions were taken at the end of March.

Furthermore, even by mid-May, the available government data were incomplete in that they covered only a narrow portion of COVID-sensitive services—food services and drinking places—in addition to the sales of retail goods, which were of less concern since they were much less affected by social distancing than services categories.⁸ The nontraditional data shown here and others—such as announced school closures, tracking estimates of light vehicle sales, hotel occupancy, movie ticket receipts, transit ridership, flight cancellations, and Google Trends searches for both unemployment insurance and layoffs—were crucial for quantifying the impact on the economy during that time.⁹

5. While initial claims for Unemployment Insurance were available at a weekly frequency, essentially in real time, during the pandemic recession, the translation of initial claims into employment losses was not straightforward because initial claims overstated true employment losses. For more details, see Cajner et al. (2020b).

6. While the ADP-FRB data are available on an ongoing basis only to policymakers in the Federal Reserve System, Cajner et al. (2020c) published the ADP-FRB data from February through April 2020, which indicated job losses of 18 million through April 4th.

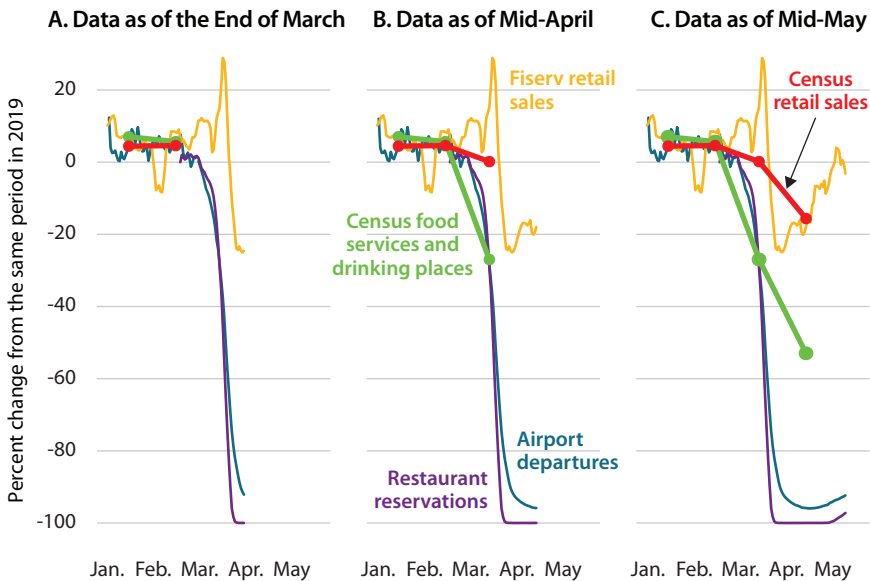
7. For details on the construction of the Fiserv card swipe data index, see Aladangady et al. (2022).

8. Government data on other services spending—such as the Census' Quarterly Services Survey—come out with even more of a lag. The first and second quarters of 2020 preliminary services spending data were released on May 20 and August 19, 2020, respectively.

9. School closure information is from Education Week and Burbio; light vehicle sales tracking information from J.D. Power; hotel occupancy from Smith Travel Research; movie ticket

FIGURE 9.3

Snapshots of Consumer Spending Data in 2020



Source: Census Bureau n.d.a.; Fiserv 2020; OpenTable 2020; Transportation Security Administration 2020.

Note: Airport departures, restaurant reservations, and Fiserv retail sales are seven-day moving averages.

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So, even though the initial policy actions and the discussions of further actions kicked off before the economic slump began, the corroboration provided by nontraditional data sources may have hastened Congress' decisions on the CARES Act (and a supplementary Paycheck Protection Program and Health Care Enhancement Act, which was passed in late April 2020) and Federal Reserve deliberations on Fed facilities.^{10,11} Had policymakers been forced

receipts from Box Office Mojo; transit ridership from the New York Metropolitan Transportation Authority; and flight cancellations from flightstats.com.

10. The first pandemic-era facilitates were announced shortly after the FOMC meeting of March 15. At the time, FOMC participants cited reports on the pandemic's impact on business sectors, such as air travel, cruise lines, hotels, tourism services, sports and recreation, entertainment, hospitality, and restaurants. See FOMC (2020). Additional facilities were announced in late March and in mid-April. For a summary of Fed actions during the COVID-19 crisis, see Milstein and Wessel (2021).

11. The January 2021 Economic Report of the President, put together by the Council of Economic Advisors, cites numerous nontraditional data sources to describe the economic landscape and to support the passage of various pieces of legislation. Similarly, congressional press

to wait until May for the release of government data to fully understand the magnitude of the impact of social distancing, it is possible that some of their policy actions may have been smaller, less well targeted, or delayed.

Had that delay occurred, what might have been the cost? It is hard to know for sure, and it is possible that the costs would not have been that high. However, there are risks that would have been heightened by a smaller policy response or a delay.¹² Regarding the Fed, it is likely that a delay in some of the facilities would have led to greater disruptions in the financial system, as uncertainty and a loss of confidence would have worsened. Even just the announcement of the facilities led to rapid improvements in financing conditions in bond markets, narrowing spreads, and increased access to markets for many issuers. If the Fed had been delayed, a flood of defaults on loans to businesses may have led more businesses to close their doors permanently, leading to costly reallocation that might have greatly slowed the recovery. As we learned from the Great Recession, this type of dislocation is hard to reverse and can have lasting impacts on the economy.

On the fiscal policy side, the CARES Act provided needed assistance to individuals who lost their jobs in the pandemic and was essential for households with little savings or outside support. The longer these households went without support, the longer they might have gone without food or other necessities. They might also have cut back sharply on discretionary spending, slowing the economy more. Furthermore, without the prospect of immediate support, some vulnerable households may have felt the need to liquidate longer-term assets such as retirement funds or housing, which, in turn, could have had long-lasting and negative effects on their economic well-being and led to further fragility in financial markets. Finally, without the prospect of immediate and substantial support, some workers might have returned to unsafe working conditions too early and, in doing so, may have worsened the pandemic.

Thus, nontraditional data likely played some role, and possibly a consequential one, in supporting both monetary and fiscal policy actions. But the sharp downturn of March 2020 is an anomaly in the modern era. Specifically, private nonfarm payrolls posted their largest decline of the downturn in the second month of the recession. By contrast, it took 26 months to reach the maximum employment decline during the Great Recession. Given this disparity between the pandemic recession and other downturns, can a case be made more generally that the timely measurement benefit of alternative data is worth investing in?

Even in more normal times or more typical downturns, nontraditional data allowing for timely measurement can still provide policymakers with

releases oftentimes cited nontraditional data during the discussion surrounding pandemic-related legislation.

12. See Doniger and Kay (2021) for estimates of the employment implications of a delay in the provision of Paycheck Protection Program loans.

an important tool. Although the benefits are hard to quantify, they may be substantial. First, government data are revised and measured with noise, and the alternative data provide means for policymakers to know the state of the economy with greater precision. Second, the timely aspect of the data— they lead the government data by a few weeks to a few months—is important for policymaker decision-making. It could also be important for communication since describing the state of the economy accurately in real time can only help policymakers' credibility. Third, nontraditional data sources can substitute for government statistics at times when government data themselves are delayed, such as during a government shutdown.¹³

An example from the Great Recession helps make the first point. The constellation of data the Fed observed in mid-2007 provided a markedly different signal from what we now view as the economic situation before the Great Recession started.¹⁴ Specifically, at the August 7, 2007, meeting of the FOMC, the committee had in hand—among other indicators—the first print of the July employment data from the BLS and estimates of second-quarter GDP from the Bureau of Economic Analysis. For employment, the July employment report reported a gain of 92,000 for nonfarm payroll employment and the Greenbook—the Board staff's forecast document at the time—noted that “labor demand has continued to run slightly ahead of our expectations, with private nonfarm payrolls up an average of 115,000 per month over the last three months.” In terms of GDP, at the time the Bureau of Economic Analysis had published an estimate of real GDP growth of 3.4 percent in the second quarter, and policymakers were looking at a first half growth rate of roughly 2 percent. Overall, in real time growth appeared to be holding up in the two primary indicators of an economy's well-being.

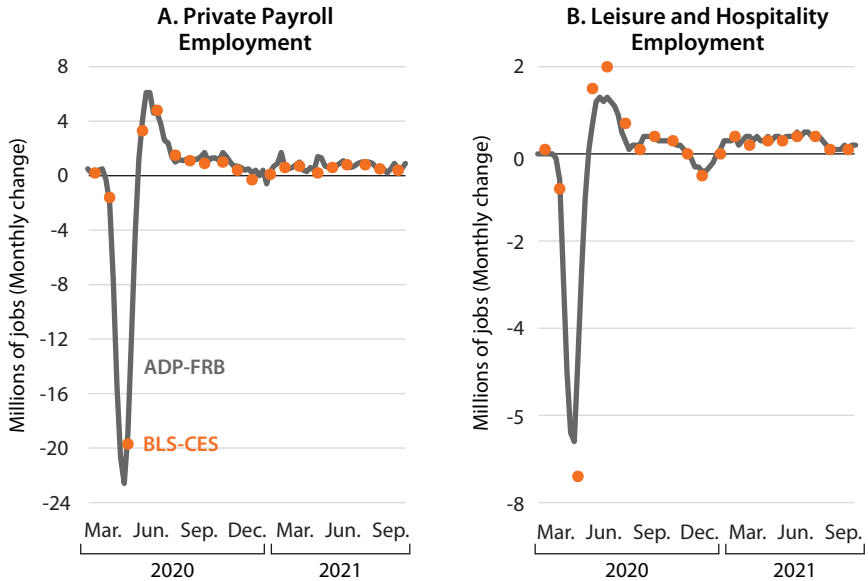
In retrospect, and with fully revised data in hand, the economic landscape was somewhat less supportive of growth than was thought at the time of the August 2007 FOMC meeting. Specifically, fully revised employment decreased by 33,000 in July, and the average growth over the three-month period mentioned above was 93,000. In terms of total output, the latest estimate of average real GDP growth over the first half of 2007 was 1.2 percent, roughly $\frac{3}{4}$ percentage points lower than the estimate available in August 2007. Had the revised data, or an expansive set of nontraditional data, been in policymakers' hands at the time of the August meeting, a better picture of a less robust state of the economy might have assisted policymakers. That is, more information could have pulled forward the view that broader economic conditions were weakening. Focusing on the subsequent year, Cajner et al. (2022) show that

13. Given that there have been three government shutdowns in the past 10 years, two of which led to delays in government data releases, even outside the window of the actual shutdown, this benefit is not trivial.

14. The National Bureau of Economic Research dates the Great Recession from December of 2007 to June of 2009.

FIGURE 9.4

Timing of ADP-FRB and BLS CES Employment Data Releases for Change in Employment, March 2020–July 2021



Source: ADP, Inc. n.d.; Bureau of Labor Statistics (BLS) n.d.; authors' calculations.

Note: For ADP-FRB, paid employment concept is plotted.

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ADP-FRB data would have provided a better real-time signal of employment losses than BLS data. By August 2008, real-time BLS estimates showed private sector job losses totaling about 750,000, while ADP-FRB was at approximately 1 million—closer to the current vintage estimate of 1.4 million jobs lost.

As shown above in Figure 9.4, during the COVID-19 crisis, the ADP-FRB data have done a terrific job of tracking the employment gains seen in the BLS employment report, suggesting that both these datasets are useful for shedding light on employment changes in the economy. But they are not always exactly aligned, in which case analysts can better approximate the true state of the world using both; this is particularly important when they temporarily diverge (Cajner et al. 2022).

Granularity

In addition to providing timely information about aggregate statistics, nontraditional data often also allow for more detailed measurement, which we refer to as granularity. Examples of granularity include economic measurement across geographic areas (e.g., states or counties), industries, different individual characteristics (e.g., income), and high-frequency time periods. Sometimes such granular information is available in official statistics but typically only with very long lags. In this section, we will discuss three main benefits of granular data. First, by adding information that is not included in aggregate statistics, granular data can lead to a better understanding of real-time developments. Second, this understanding could lead to a more targeted policy response. Third, timely analysis with granular data can lead to essentially real-time policy evaluation, which can, in turn, also inform follow-on policy actions. We will illustrate these benefits with examples from the COVID-19 pandemic recession.

Granularity and Understanding of Real-Time Developments

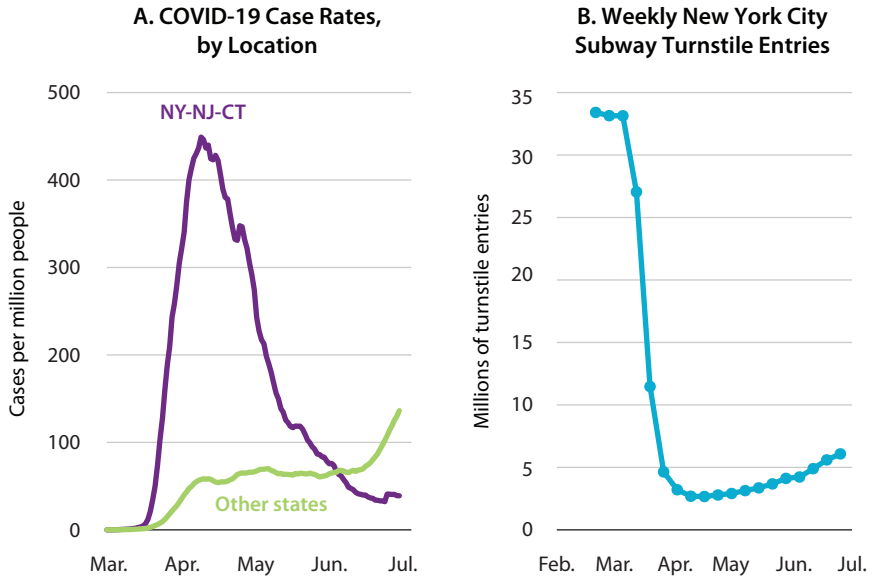
During the early weeks of the first wave of the pandemic, northeastern parts of the country—in particular, New York, New Jersey, and Connecticut—experienced more severe COVID-19 outbreaks than the rest of the country (Figure 9.5a). At that point, the economic effects of the pandemic could not be well assessed with aggregate statistics. Instead, the geographical variation available in nontraditional data helped to better understand links between health shocks and the responses of economic variables. For example, many analysts turned to data on public transportation in New York City (Figure 9.5b) to get a better understanding of how individuals and businesses would react to rising COVID-19 cases.

Similarly, employment data at the state level were used to better link job losses to COVID-19 outbreaks. Many papers, which started appearing in the summer of 2020, used state- and county-level employment data to distinguish between the economic effects of voluntary responses and state-mandated restrictions (Gupta, Simon, and Wing 2020). The availability of granular data for the early affected areas allowed policymakers to get a better estimate of how severe the pandemic was likely to be for the country as a whole; indeed, at that point, aggregate data would not have picked up the severity.¹⁵ In addition, the availability of granular geographic data would have enabled state and local governments to decide on policy responses that were tailored to their specific needs.

15. The geographic breakdown available in the Fiserv data is another example of such granularity. Because the data are broken down by state, it was possible to track the effect of the pandemic on spending as waves of cases hit different parts of the country.

FIGURE 9.5

COVID-19 Case Rates and New York City Subway Turnstile Entries, March–July 2020



Source: Metropolitan Transportation Authority 2020; New York Times n.d.

Note: Seven-day moving averages of COVID-19 data are depicted. Weekly estimates of transportation data are seasonally adjusted.

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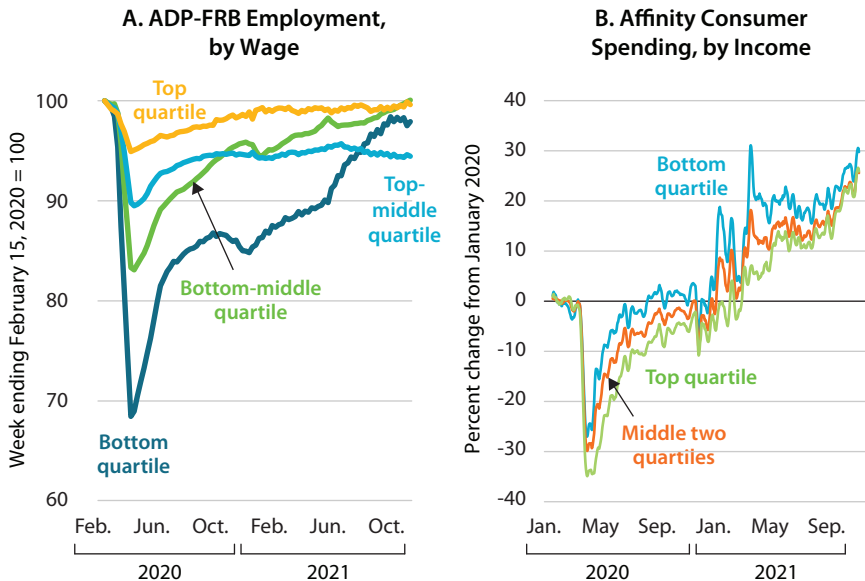
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Granularity and Policy Design

Another important example of granularity is the distribution of job losses during the pandemic recession, which was relevant for the design of many policies during that period. For example, the pandemic recession had much larger employment effects on some service industries, such as leisure and hospitality, mostly due to voluntary and mandatory social distancing. Those industries are also more likely to employ low-wage workers. As a result, the employment of workers in the bottom quartile of the wage distribution fell substantially more than the employment of workers with higher incomes (Figure 9.6a). Knowing the distribution of employment losses by wage may have helped to better design policy responses for Unemployment Insurance compensation and better target stimulus checks. In turn, these policies helped to support consumer spending for the low-income group (Figure 9.6b).

FIGURE 9.6

Employment and Consumer Spending by Income, Indexed to February 2020



Source: ADP, Inc 2020–21; Affinity via Opportunity Insights 2020–21; authors' calculations.



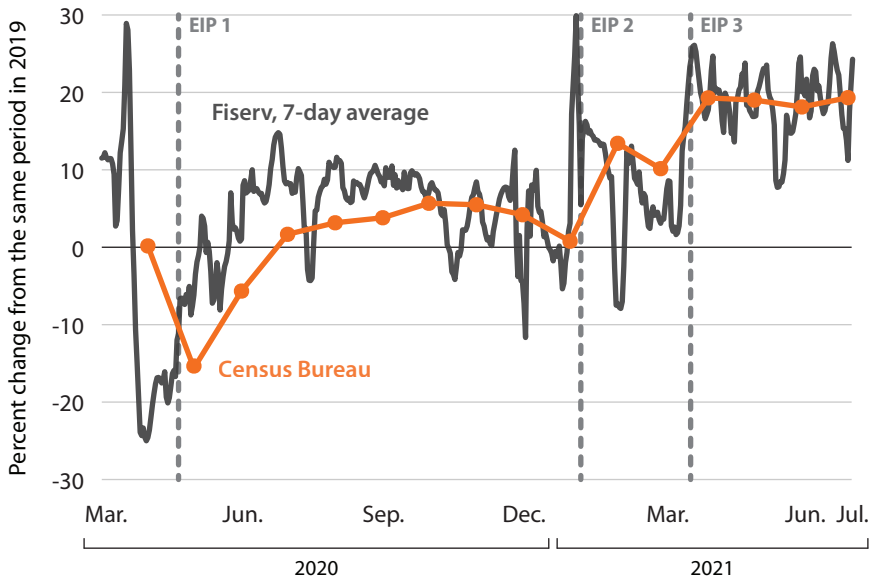
Granularity and Real-Time Policy Evaluation

Finally, access to real-time granular data opens the door to real-time policy analysis. In turn, this analysis can be used to fine-tune subsequent policy actions. One of the clearest examples of this in the pandemic recession is the analysis done to study the three rounds of stimulus checks that went out in April 2020, January 2021, and March 2021. One granular dimension that was immediately useful to track the effectiveness of the stimulus checks in promoting spending was the high-frequency nature of some of the nontraditional data. As Figure 9.7 shows, the Fiserv daily spending index was able to highlight surges in spending associated with stimulus check receipt that would not have otherwise been evident from the monthly data reported by Census.

Other types of granular household-level data led to even more detailed estimates of the response to the stimulus checks. Using household balance sheet data, some researchers were able to publish estimates of the response to the first round of stimulus checks within a few months of the disbursement (Baker

FIGURE 9.7

Fiserv and Census Consumer Spending



Source: Census Bureau n.d.a.; Fiserv 2020-21; authors' calculations.

Note: Vertical dashed lines indicate the week in Economic Impact Payment (EIP) direct deposits commenced. Physical checks continued to be disbursed for three to four weeks after these dates.



et al. forthcoming; Chetty et al. 2020; Cox et al. 2020). These early analyses of the response to stimulus checks showed that even when services spending was very constrained due to social distancing, households, especially lower-income ones, still managed to spend significantly out of their stimulus checks. When the second and third rounds of stimulus checks were planned, these analyses were already available to inform policymakers of expected outcomes. Other important examples of real-time analysis done, but not discussed here, were on the Paycheck Protection Program (Autor et al. forthcoming; Chetty et al. 2020; Hubbard and Strain 2020) and on Unemployment Insurance benefits (Coombs et al. 2021; Ganong et al. 2021).

These types of real-time analyses are not a panacea for policy design. They are only useful to the extent that they are accurate, available to, and acted on by policymakers. When the analysis is conducted by researchers outside of the government using privately sourced data, it is both difficult for policymakers to control the subject of the analysis and time-consuming for government actors to vet the data and the quality of the analysis. Still, in the case of the pandemic recession, there is some evidence that policymakers leaned on the work of

Opportunity Insights to determine the income thresholds in the second and third rounds of stimulus checks.¹⁶

An additional forward-looking benefit is that the availability of granular data opens the door for future policymakers to condition policy on the outcome of real-time analysis; government agencies could contract with nontraditional data sources such that they are prepared to do some of this analysis in house or if they could contract with outside researchers to carry out and report the analysis. This type of analysis could even be an explicit part of a policy's design and legislation. For example, the Council of Economic Advisors was legislated to provide quarterly reports on the effectiveness of the American Recovery and Reinvestment Act after the Great Recession.

Crisis-Specific Data Gathering

The information policymakers needed during the pandemic differed markedly from the indicators used in a typical economic downturn. As a result, substantial crisis-specific data gathering was carried out by not only government agencies but also private data providers. Most notably, during the pandemic policymakers paid particular attention to health-related indicators such as COVID-19 cases, hospitalizations, deaths, disease reproduction rates, variants, and vaccinations—since those were highly informative about possible disruptions to the economy. The importance of health-related data was, for example, reflected in FOMC statements that said “the Committee’s assessments will take into account a wide range of information, including *readings on public health*, labor market conditions, inflation pressures and inflation expectations, and financial and international developments (emphasis added; Board of Governors 2022).”

At the start of each COVID-19 wave, policymakers tried to understand how fast a particular COVID-19 variant would spread and how severe the associated health outcomes could be. This information was used to predict possible behavioral responses of consumers and businesses, which in turn allowed for an assessment of the possible economic effects of each COVID-19 wave. While the importance of health-related indicators is obviously specific to the pandemic recession, other nontypical economic downturns could require gathering crisis-specific data. For example, a climate disaster leading to a recession would likely require gathering timely, granular data on agriculture, migration, or weather patterns to better understand the possible evolution of the economy in real time.

Most of the health-related indicators that were informative during the pandemic did not exist before it. While official health agencies worked hard to provide the necessary health-related data during the pandemic, it is important to

16. See The Economist (2021).

also emphasize the role that the private sector played. For example, institutions such as Johns Hopkins University, the *New York Times*, and the collaborative, volunteer-run COVID Tracking Project provided high-quality and regularly updated health data, including at very granular levels (e.g., by state or county and by demographic characteristics).

To better understand some specificities of the pandemic and the related downturn, several new statistics were developed. First, school instruction policy had important consequences for the labor supply decisions of parents with young children. Thus, policymakers closely followed data on shares of schools with in-person, hybrid, and remote instruction policy (Figure 9.8a). As school districts varied in terms of their school instruction policies, these data were not readily available and were thus gathered by private sector companies, such as *Education Week* and Burbio.

Second, soon after the pandemic started, office occupancy dropped precipitously, either because businesses switched to remote work or because they laid off their employees. The aforementioned data on transit ridership and new data on office occupancy (Figure 9.8b), such as those provided by Kastle Systems, were used to measure in real time how quickly employees stopped coming to offices and, later during the pandemic, how quickly businesses returned to in-person work. These measures indirectly relay information about the state of the labor market and the location and form of the majority of white-collar employment. Aside from the pandemic, these metrics should eventually return to their pre-pandemic norms and likely have little intrinsic informational content going forward.

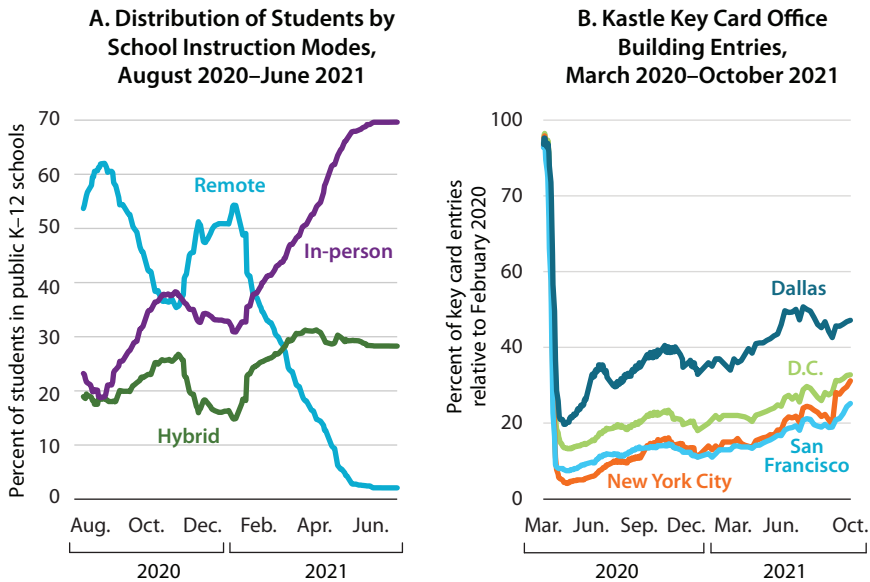
The next three categories of new nontraditional data have a higher likelihood of being leveraged to extract information about economic outcomes after the pandemic. Mobility measures, our third category, obtained, for example, from SafeGraph, Google Mobility, and Apple Mobility Trends data, were used to infer activity from the location of requests to mapping software or from the geolocation of a particular cellphone. These data were able to shed light on how many people were socially distancing by staying at home or visiting service-providing businesses or parks.

Fourth, many analysts and policymakers initially feared that the social distancing and dislocation of the pandemic would lead to a burst of business exits and thus leave permanent damage to the productive capacity of the economy. Official statistics on business exit and entry are available with lags of at least a year or even more; but, data from private data sources, such as ADP, SafeGraph, Womply, Yelp, and Homebase, allowed the measurement of business exit and entry in real time and thus allowed a better assessment of potential scarring effects in the economy.¹⁷ These data thus had the potential to affect

17. The ADP payroll data can be employed to look at inactive payroll accounts; SafeGraph geolocation data can be leveraged to measure businesses that no longer have active visits;

FIGURE 9.8

School Instruction Mode and Keycard Office Entries, 2020–2021



Source: Burbio, Inc 2020–21; Kastle Systems 2020–21; authors' calculations.

Note: Based on employee key card entries into office buildings. 7-day average through January 6, 2021, and weekly readings thereafter.

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forward-looking policy or decisions about extensions of different policies, such as the Paycheck Protection Program.

Fifth, and finally, beginning in early 2021, supply bottlenecks severely impacted the ability of the economy to recover and led to notable inflation pressures. Nontraditional data, such as container dwell times and counts of ships waiting to unload at port, were helpful to measure the extent of bottlenecks in real time.

Two new products from the Census Bureau—the Small Business Pulse Survey and the Household Pulse Survey—stand out as excellent examples of traditional data providers implementing a flexible production framework to provide valuable nonstandard information.¹⁸ The Small Business Pulse Survey

Womply exits are based on card transactions; and data on clock ins and clock outs from Homebase can be used to measure business exits. See Crane et al. (2020).

18. See Buffington, Fields, and Foster (2021) for more details on the Pulse surveys.

provided timely, high-frequency, granular data on the effect of the pandemic on small, single-location employer businesses in the United States. The survey covered questions on overall effect, operations, challenges, finances, and expectations. The Household Pulse Survey brought high-frequency data on households to bear during the pandemic. Specifically, it provided timely data on a range of ways in which lives were impacted by the COVID-19 pandemic: employment status, spending, food security, housing, physical and mental health, access to health care, and educational disruption.¹⁹ Importantly, the flexibility exhibited by the Census Bureau in the rollout of the Pulse surveys can and should be applied in future emergency situations.

To summarize, there are some variables that do not provide much (or any) information about the overall path of the economy during normal times, which we would not advocate tracking even with an unlimited budget for data. However, during the pandemic, they proved to be crucially important because they provided qualitative and, at times, quantitative understanding of current developments, and thus they informed the policymaking process. Gathering these crisis-specific data often required substantial resources. If subsequent economic downturns differ from typical recessions, it might be helpful to plan how to improve the necessary crisis-specific data collection and allocate the resources to do so.

Pitfalls in Using Alternative Data

Statistical agencies are staffed with statisticians, data scouts, economists, analysts, and surveyors because of the complexity and rigor necessary to produce timely and reliable statistics. While data storage, manipulation, digitized collection, and the addition of metadata have dramatically decreased the cost of data processing and collection, these aspects are only a small fraction of the investment needed to collect and provide reliable estimates over time. The costs of nontraditional data are substantial and include the cost of purchasing data by policymaking institutions along with the expertise necessary to address pitfalls that arise from these data. These pitfalls include limited history and seasonal adjustment issues, sample representativeness, methodological consistency, the possible untimely cessation of data collection, and substantial variability that may diminish the signal value to the content of a given data release. This section will detail each of these complications in the context of the pandemic recession.²⁰

Nontraditional data can be expensive to government agencies. Moreover, the costs of purchasing data have increased dramatically over the past several years as voluminous amounts of information have become valuable assets to

19. Importantly, and in contrast to most of the nontraditional data gathered and published during the pandemic, the Household Pulse Survey provided demographic characteristics for their measures of the economic impacts of the pandemic, such as race.

20. Two costs we do not address here, but are nevertheless worth consideration, are “hold-up costs” and private companies trading on “insider” information from a nontraditional data release.

organizations' core operations.²¹ Importantly, firms differ in how willing they are to consider the public policy and academic benefits of their data, and they price accordingly. Many data purveyors charge a lower price for academic use than for nonacademic use, which often includes government agencies. As a result, the government is sometimes priced out of important data assets when the pricing offered is comparable to what might be charged to a private organization, such as a hedge fund, that can use the data profitably.

Perhaps the most important drawback to using nontraditional data is that many of these data sources do not have long time series, which leads to several disadvantages. First, it makes seasonal adjustment difficult or sometimes impossible, as typical approaches used to remove seasonality effectively from a time series require at least five or more years of data.²² To deal with seasonal adjustment in the absence of a long time series, most analysts adjusted how they presented their data, such as taking the percentage change between same time period in 2020 and 2019. One downside of this approach is that week-to-week fluctuations in the percentage change are heavily influenced by idiosyncratic fluctuations in the 2019 level. For instance, there are sharp movements in the weekly series when holidays move from one day or one week to another. We can see this in some of the spending indexes mentioned earlier, where the timing of Labor Day leads to substantial jumps in the spending series.²³ This is especially easy to see in Figure 9.9, which presents the plot of restaurant reservations (i.e., a proxy for spending) alongside leisure and hospitality employment.

One can easily see the imprint of the Labor Day holidays in 2020 and 2021, which at the time might have led the casual observer to expect a burst in restaurant and services spending or possibly a spike in leisure and hospitality employment, neither of which materialized. These differences are not easily solved by an overarching methodology, as different series exhibit substantially different seasonal patterns: for example, health care spending in March is impacted by the expiration of flexible spending accounts, an event that does not influence other spending.

A second disadvantage of not having a long time series is that it hinders the ability of data users to contextualize a particular reading relative to historical trends or prior business cycles. A good example of this comes from the new COVID Impact Survey and the Household Pulse Survey, both of which presented numbers of critical importance but had a limited basis of comparison. For instance, the food insecurity rate, a good metric for determining household distress, was surveyed in the COVID Impact Survey, which started in April of

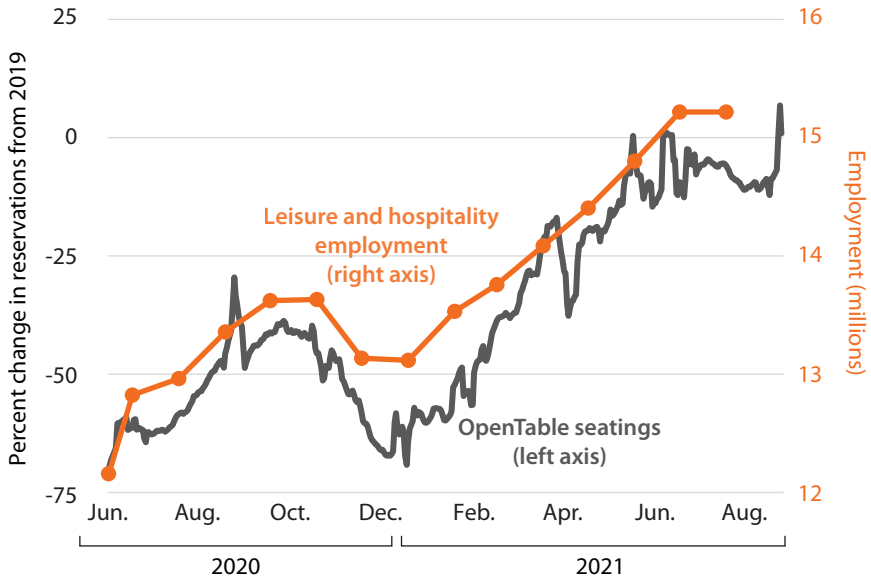
21. Moreover, many private data providers have consolidated (Laney 2020).

22. According to Census, the proper identification and estimation of seasonal and calendar effects requires a span of 10 to 15 years of data or a minimum of 5 years to properly estimate a seasonal pattern and 7 years for calendar effects and moving holidays. See Dagum (1988) and U.S. Census Bureau (2008).

23. Holiday effects can also be found in COVID-19 health data, including cases, hospitalizations, and deaths.

FIGURE 9.9

Open Table Reservations and BLS Leisure and Hospitality Employment, June 2020–September 2021



Source: Bureau of Labor Statistics (BLS) n.d.; OpenTable 2020–21; authors' calculations.



2020. However, it was hard to know whether the resulting insecurity rate was elevated without earlier readings. Researchers spliced the data with similar information from the quarterly National Health Interview Survey, but the measured change was difficult to interpret.²⁴

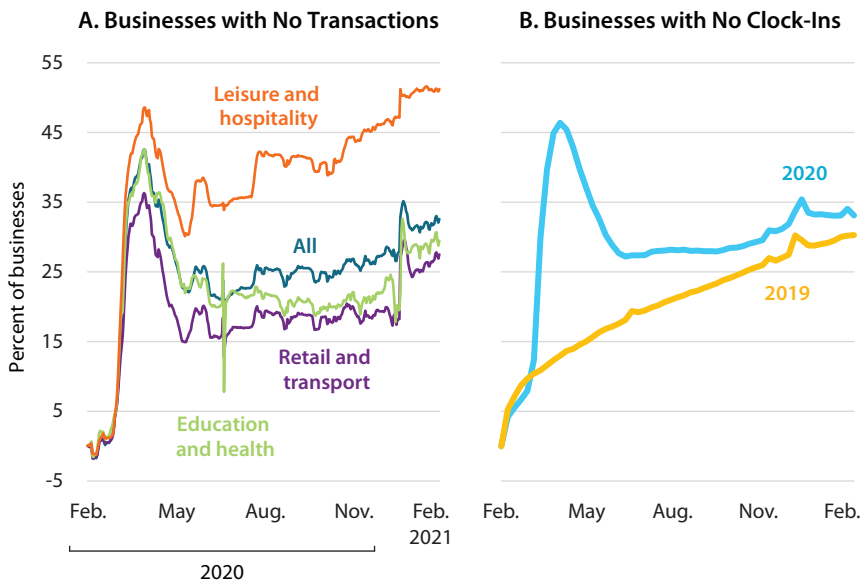
Another example comes from using nontraditional data to measure business exits and closures. As described by Crane et al. (2020), payroll information from ADP, card transactions from Womply, and data on clock-in and clock-out tracking from Homebase can be used to measure business exits a year or two before the standard data sources from the Census and BLS are released.²⁵ How-

24. Similarly, the Census Pulse data were spliced with historical data from supplementary Current Population Survey questions (Bitler, Hoynes, and Schanzenbach 2020).

25. Womply is a credit card processor and provides a measure of firms that have ceased point-of-sale transactions, while the Homebase clock-in and clock-out software facilitates tracking

FIGURE 9.10

Measures of Small Business Closures



Source: Womply via Opportunity Insights 2020–21; Homebase 2020–21; authors' calculations.

Note: The samples are limited to businesses with a transaction on February 15th, 2020, for figure A., and businesses with a clock-in on February 15th, 2020, for figure B.

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ever, the resulting closure patterns are also driven by client attrition rather than business shutdown, confounding the measurement of true business closures.

The 2020 Womply data are hard to interpret as it is difficult to translate what a near 40 percent closure rate says about true business exits (Figure 9.10a). In contrast, the longer time series we have for Homebase allows a comparison with 2019 figures (Figure 9.10b). By February of 2021, exit in the Homebase series was a striking 33 percent. But once that number is compared to the 2019 attrition rate, excess exits were only about 3 percentage points higher, a much less worrisome picture.²⁶

A third disadvantage of the lack of historical data for many nontraditional data series is that there often is little to no track record to see how these data

firms that have not had clock-in events over a given period of time.

26. Ideally, the comparison would contain multiple years of early attrition rates to average over so as not to draw too many conclusions from just 2019, which could reflect a particular year effect.

translate to or predict standard data sources. A good example of this can be found in leveraging nontraditional data to predict rental price movements. The Zillow Rent Index, ApartmentList, and CoreLogic rental price indexes can all be used to track rental prices at a high frequency in a timely manner. However, both the Zillow Rent Index and ApartmentList have short time spans, with the Zillow Rent Index's current methodology starting in 2019 and the ApartmentList data starting in 2017. Most importantly, the nontraditional data tracks rents for new leases by a new tenant, which is conceptually different from the change in shelter cost for all renters. Moreover, any statistical relationship between the Consumer Price Index for renting and the nontraditional data such as ApartmentList and CoreLogic will be difficult to estimate due to the nontraditional data's short history.

Even if there are sufficient time series, past relationships may no longer hold due to the pandemic's reshuffling of the economic landscape. A good example of this is high-propensity business applications from the weekly Business Formation Statistics from the Census Bureau. The Business Formation Statistics depend on the historical relationship between business applications (Employment Identification Numbers) and establishment formation.

The series in Figure 9.11 show that Employment Identification Number applications increased sharply in the second year of the pandemic. In normal times, this would imply healthy growth in new business entry.²⁷ Unfortunately, the relationship between Employment Identification Numbers and new establishments with active payroll might no longer hold. This could result from business applications covering an entirely new form of venture or new work-from-home businesses that do not employ workers expanding rapidly during the pandemic.²⁸ Due to lags in the publication of official data on business entry—a similar problem to the data on exit mentioned above—it could be years before we know if the businesses identified by the Business Formation Statistics show up in official data.

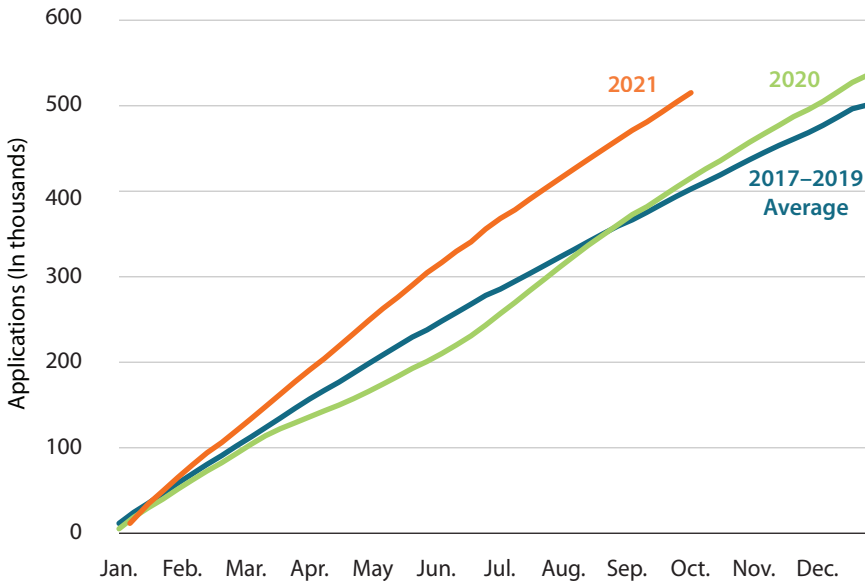
Beyond short histories, nontraditional data face additional hurdles that may make them unreliable. The fact that they may be nonrepresentative presents one of the largest hurdles. Many of the databases that were most helpful during the pandemic recession were sampled from client bases and firms' administrative records that represent only a small fraction of the overall population of activity one would want to track. Small samples are not necessarily an insurmountable hurdle to representative aggregates because low-level aggregates could be weighted and benchmarked to properly reflect a particular population. For example, the ADP-FRB series—which is roughly based on a sample of 20 percent of employment—is stratified to characteristics derived from the

27. See Bayard et al. (2018).

28. For example, this could happen if the average employment count of payroll-maintaining establishments changes. One possibility during the pandemic could be a wholesale shift toward microbusinesses (Hartman and Parilla 2022).

FIGURE 9.11

Cumulative New Business Applications, Select Years



Source: Census Bureau n.d.b.

Note: Business applications with planned paid employees.



Quarterly Census of Employment and Wages to improve its reliability for measuring employment changes.

The ADP-FRB series approach is similar to the BLS use of Quarterly Census of Employment and Wages weights for its payroll data. This contrasts with Homebase data, which have become an important indicator for small business employment and activity during the pandemic.²⁹ Homebase is a scheduling and time-tracking tool used mostly by small businesses—it covers just 2 percent of employment and 1 percent of establishments in the accommodation and food services industry. And this comparison is within a sector Homebase covers well. For other services, the coverage is much smaller—in the tenths of a percent.³⁰ Unfortunately, the small sample issue is compounded with sample

29. See Kurmann, Lalè, and Ta (2021), Bartik et al. (2020), Bartlett and Morse (2020), and Granja et al. (2020).

30. These nontraditional indicators should be employed for aggregative forecasting with caution, as a Homebase-based indicator predicted a job loss of more than 800,000 jobs in September

selection issues, since the sample is just the customer base and there is a significant amount of churn within the sample of firms employing Homebase. This is typical of most opportunity surveys, and researchers generally lack a way to weigh the data to make it represent the whole economy. Representativeness problems are exacerbated when attempting to delve into the industry, geographic, or demographic heterogeneity of the data series.

Another hurdle for nontraditional data is methodological changes. For traditional data, these are typically folded into federal statistical releases during annual or comprehensive revisions and most often are accompanied by a revision to the historical data so that the time series is consistent. This is not necessarily the case with nontraditional data, as the data collection and provision of statistics are fundamentally not the focus of the enterprise that releases the data. Two examples illuminate this situation. Kastle occupancy reports, which used keycards as a metric of employees return to work in person, changed its methodology from daily to weekly data in March 2021. Fortunately, it re-estimated the entire time series with the new methodology. On the other hand, SafeGraph, a company that aggregates anonymized location data from numerous mobile device applications to provide insights about physical places, changed its methodology for imputing devices' locations in March 2021. Because SafeGraph did not re-estimate the historical data, the series suggests there was an abrupt change in social distancing measures in March of 2021 when that is likely not the case.

Sometimes nontraditional data series just cease. As the pandemic has dragged on, several organizations have stopped reporting data. For example, the Yale Labor Survey, an online survey of households akin to the Current Population Survey that started collecting and publishing data in April 2020, provided rapid and inexpensive information on employment, unemployment, and other labor market measures that tracked the official measures well but provided more frequent and timelier data. The last Yale Labor Survey covers the week ending February 27, 2021 (Tobin Center 2021). Somewhat similarly, portions of the Census' Small Business Pulse Survey and Household Pulse Survey started, paused, or stopped altogether as the Census revised the survey and added new questions. For example, data items that were rotated off the Small Business Pulse Survey—series that would have been useful in all phases—included questions about temporary closures, supply chain questions, planned capital expenditures, rehiring, and remote work. Last, the COVID Tracking Project—a well-organized, formatted, and consistent purveyor of COVID-19 health data—stopped collecting new data in March 2021. And while the federal health data improved over the course of the pandemic, the sources and structure varied tremendously, leading researchers and policy officials scrambling for alternative sources of information.

of 2020, whereas employment increased by more than 300,000 jobs that month.

One final hurdle for nontraditional data is that they are sometimes so noisy that they provide little signal for economic indicators of interest. Moreover, even indicators that did well at the height of the pandemic, such as the ability of Google Trends to predict unemployment claims and Homebase to provide insight into overall employment, might be less helpful once the period in which dramatic swings in activity were all highly correlated moves further into the past. To gauge their value, all these measures should be evaluated for their signal content outside of the dramatic 2020 months and when the forecasting framework includes additional indicators of economic activity.³¹

Conclusions

Nontraditional economic data were an important resource for policymakers during the pandemic downturn and recovery. These alternative data sources provided a view into economic activity weeks or months before most traditional data would become available. They also illuminated household and business activity at a granular level, helping to clarify the mechanisms affecting the pandemic economy. Having access to nontraditional data specific to this episode also allowed policymakers insight into how the virus and associated health policies were evolving. One important question is whether these data were valuable only because of the unusual and rapid nature of the recent downturn or whether they will be important in future economic crises.

At the onset of any crisis, economic policymakers must identify whether they are confronting a demand shock or a supply shock and the magnitudes and likely persistence of those shocks. As the episode unfolds, policymakers also want to understand how the shocks are propagating to the broader economy. Consequently, many of the series used in the pandemic recession will likely prove useful in most downturns: daily point-of-sale card swipe data, surveys of consumer sentiment, credit card data, and weekly automotive transactions should give an early warning of shocks to demand. And understanding the propagation of shocks to the rest of the economy may be aided by nontraditional data on payrolls, business exits/entries, or supply chain disruptions. Furthermore, these are some of the series policymakers need to have and understand for every crisis, and they should plan for the next crisis by investing in nontraditional data sources now—to build longer time series of timely indexes to supplement traditional data sources, to improve the usability of existing data, to validate the granular details that may be available and become important during a downturn, and to hone their skills in working with these data. Even if these nontraditional data sources have limited use during an expansion, it is

31. While there is evidence that nontraditional data inputs like credit card data and Google Trends improve forecasting (see Chapman and Desai 2020 and D’Amuri and Marcucci 2017), the gains are likely minimal when combined with the full suite of possible economic data that can be folded into a model (Li 2016).

worth developing them to be prepared for the next crisis, the next government shutdown, or the unexpected.

Some shocks, often supply shocks, seem more idiosyncratic across episodes, and so the relevant data are as well. In the 1970s, timely data on global oil markets and inflation expectations would have been valuable but were largely unavailable. In the most recent recession, data on COVID-19 hospitalizations and public shutdowns were valuable but seem unlikely to be important in future cyclical events. It is hard to know what types of idiosyncratic series will be valuable in future episodes, but a culture that embraces transparency and data sharing can only help.

It is also important to understand the pitfalls of using nontraditional data. The absence of a long time series in many of these series hinders seasonal adjustment, makes levels difficult to interpret, and impedes comparisons at a business cycle frequency. These data can also be unreliable because they are nonrepresentative, methodologically inconsistent, highly variable or noisy, or susceptible to discontinuation. The resources to develop the human capital to address these issues are large—and that is over and above the cost of the data itself.

Nonetheless, we view the benefits of nontraditional data as much greater than the costs. And some of the learning is still ahead of us. As the COVID-19 crisis is still evolving, a full accounting is still to come. High-frequency, granular data will probably continue to reveal aspects of business cycle dynamics that we can learn from for many years.

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Abbreviations

ACA: Affordable Care Act
AGI: Adjusted Gross Income
AMI: area median income
AMT: Alternative Maximum Tax
ARP: American Rescue Plan
ARRA: American Recovery and Reinvestment Act
BEA: Bureau of Economic Analysis
BLS: Bureau of Labor Statistics
CARES: Coronavirus Aid, Relief, and Economic Security Act
CBO: Congressional Budget Office
CCDF: Child Care and Development Fund
CCF: Corporate Credit Facilities
CDC: Centers for Disease Control and Prevention
CE: Consumer Expenditure Survey
CES: Current Employment Statistics
CHIP: Children's Health Insurance Program
CLFRF: Coronavirus Local Fiscal Recovery Funds
COBRA: Consolidated Omnibus Budget Reconciliation Act
CPI: Consumer Price Index
CPS: Current Population Survey
CRF: Coronavirus Relief Fund
CRFB: Committee for a Responsible Federal Budget
CRISM: Credit Risk Insight Servicing data linked to Black Knight McDash data
CSFRF: Coronavirus State Fiscal Recovery Funds
CTC: Child Tax Credit
DOL: Department of Labor
DPD: days past due
DPI: Disposable Personal Income
DSR: debt service ratio
EA: Euro Area
EBT: Electronic Benefit Transfer
ECI: Employment Cost Index
EGTRRA: Economic Growth and Tax Relief Reconciliation Act
EIDL: Economic Injury Disaster Loan
EIP: Economic Impact Payments
EITC: Earned Income Tax Credit
ERA: Emergency Rental Assistance program
ESA: Economic Stimulus Act

ESSER: Elementary and Secondary School Emergency Relief
ETF: exchange-traded fund
FDA: Food and Drug Administration
Fed: Federal Reserve
FEMA: Federal Emergency Management Agency
FHA: Federal Housing Administration
FMAP: Federal Medical Assistance Percentage
FOMC: Federal Open Market Committee
FPUC: Federal Pandemic Unemployment Compensation
FRB: Federal Reserve Board
GDP: gross domestic product
GFC: global financial crisis
GSE: government sponsored enterprises
HAMP: Home Affordable Modification Program
HMDA: Home Mortgage Disclosure Act
HPS: Census Bureau's Household Pulse Survey
IRS: Internal Revenue Service
JGTRRA: Jobs and Growth Tax Relief Reconciliation Act
JPMCI: JPMorgan Chase Institute
LSAP: large-scale asset purchase program
MBA: mortgage bankers association
MBS: mortgage-backed securities
MEUC: Mixed Earners Unemployment Compensation
MLF: Municipal Liquidity Facility
MPC: Marginal propensity to consume
MSLP: Main Street Lending Program
NASBO: National Association of State Budget Officers
NCP: Nielsen Consumer Panel
NIPA: National Income and Product Accounts
NPV: net present value
OECD: Organization for Economic Cooperation and Development
OPE: Online Platform Economy
OPM: Official Poverty Measure
P-EBT: Pandemic Electronic Benefit Transfer
PCE: personal consumption expenditures
PEUC: Pandemic Emergency Unemployment Compensation
PMCCF: Primary Market Corporate Credit Facility
PMMS: Freddie Mac Primary Mortgage Market Survey
PPP: Paycheck Protection Program
PTAP: Pass-Through Assistance Program
PUA: Pandemic Unemployment Assistance
PUC: Pandemic Unemployment Compensation
QCEW: Quarterly Census of Employment and Wages
QE: quantitative easing

RRP: reverse repurchase facility
SBA: Small Business Administration
SMCCF: Secondary Market Corporate Credit Facility
SNAP: Supplemental Nutrition Assistance Program
SOMA: System Open Market Account
SPF: Survey of Professional Forecasters
SPM: Supplemental Poverty Measure
TALF: Term Asset-Backed Securities Loan Facility
TARP: Troubled Asset Relief Program
TRA: Tax Reduction Act
UAS: Understanding America Study
UI: Unemployment Insurance
UST: United States Treasury
WIC: Special Supplemental Nutrition Program for Women, Infants, and Children

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Kristopher Gerardi is a financial economist and senior policy adviser in the research department of the Federal Reserve Bank of Atlanta. Gerardi received his doctorate in economics in 2008 from Boston University and his bachelor's degree in economics and physics in 2002 from Hamilton College, in Clinton, New York. He has published papers in several leading economics and finance journals, including the *Journal of Political Economy*, *Journal of Finance*, *Journal of Financial Economics*, *Review of Financial Studies*, and the *Journal of Monetary Economics*. Gerardi's research on the origins of the subprime mortgage crisis has appeared in several scholarly journals including the *Proceedings of the National Academy of Sciences* and *Brookings Papers on Economic Activity*, and has been featured in the *Economist*, *New York Times*, *Boston Globe*, and many other major media outlets. He is currently an associate editor of the *Journal of Monetary*

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Laurie S. Goodman is an institute fellow at the Urban Institute. She founded the Housing Finance Policy Center at Urban in 2013 and was its director or co-director from 2013-2021. The center provides policymakers with data-driven analyses of housing finance policy issues that they can depend on for relevance, accuracy, and independence. Before joining Urban, Goodman spent 30 years as an analyst and research department manager at several Wall Street firms. From 2008 to 2013, she was a senior managing director at Amherst Securities Group, LP, a boutique broker/dealer specializing in securitized products, where her strategy effort became known for its analysis of housing policy issues. From 1993 to 2008, Goodman was head of global fixed income research and manager of U.S. securitized products research at UBS and predecessor firms, which were ranked first by Institutional Investor for 11 consecutive years. Before that, she held research and portfolio management positions at several Wall Street firms. She began her career as a senior economist at the Federal Reserve Bank of New York. Goodman was inducted into the Fixed Income Analysts Hall of Fame in 2009. Goodman serves on the board of directors of MFA Financial, Arch Capital Group Ltd., and Home Point Capital Inc. She is a consultant to the Amherst Group and serves on CFPB's Consumer Advisory Board. She has published more than 200 journal articles and has co-authored and co-edited five books. Goodman has a B.A. in mathematics from the University of Pennsylvania and an A.M. and Ph.D. in economics from Stanford University.

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Fiona Greig is a managing director and the co-president at the JPMorgan Chase Institute, which delivers data-rich analyses and expert insights for the public good. She joined the Institute in 2014 after serving as the deputy budget director for the City of Philadelphia for two years. From 2007 to 2012, Greig was a consultant for McKinsey & Company where she consulted public and social sector clients on strategy, operations and economic development. In 2009 Greig started and ran Bank on D.C., a financial inclusion program for the District of Columbia. Greig has published research on topics including household finance, healthcare, labor markets and the Online Platform Economy, gender, and behavioral decision making. Her work has been widely cited in the media, including the *New York Times*, the *Wall Street Journal*, NPR, and CNBC. Greig has held adjunct professor appointments at the University of Pennsylvania and

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Ben Iverson is an associate professor of finance at Brigham Young University's Marriott School of Business. His research focuses on financial distress, bankruptcy, and restructuring among both firms and households. He has published papers in leading finance journals including the *Journal of Finance* and the *Journal of Financial Economics*. He currently serves as an associate editor for *Management Science*. Previously, Iverson was an assistant professor at the Kellogg School of Management at Northwestern University and an assistant economist at the Federal Reserve Bank of New York. He holds a Ph.D. in business economics from Harvard University and a B.A. in economics from Brigham Young University.

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Christopher Kurz is the section chief at the Industrial Output section in the Division of Research and Statistics at the Federal Reserve Board. His responsibilities at the Board of Governors have ranged from forecasting industrial production and motor vehicle sales to coordinating the staff forecast of GDP. Kurz's research interests are similarly broad and cover international trade, international finance, nontraditional data, and economic history. Research projects of Kurz's have employed microdata to quantify the effects of international trade on employment volatility at the firm level and back-tested systemic risk measures using historical banking data. Over the past six years, Kurz has been working on the Federal Reserve Board's Expanded Measurement Agenda (EMA). The EMA is an attempt to identify novel data sources and leverage new techniques that can be used to develop timely and accurate measures of economic activity that are relevant to the formation of monetary policy.

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Lauren Lambie-Hanson is a senior advisor and research fellow in the Consumer Finance Institute at the Federal Reserve Bank of Philadelphia. Her primary research interests include residential mortgage lending, housing affordability, and the maintenance and improvement decisions of property owners. Before joining the Consumer Finance Institute, she was a principal financial economist in the Philadelphia Fed's Supervision, Regulation, and Credit Department. Lambie-Hanson holds a Ph.D. in urban and regional studies from the Massachusetts Institute of Technology and a master's degree in public policy from the

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Pascal Noel

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Pascal Noel is the Neubauer Family Assistant Professor of Finance at the University of Chicago Booth School of Business. He is also a faculty research fellow at the National Bureau of Economic Research. His research interests include household finance, public finance, macroeconomics, real estate, and behavioral economics. His current research uses administrative consumer financial data to explore the drivers of household consumption and default decisions and their macroeconomic implications. He is particularly interested in how households respond to financial distress, inequality in financial distress, and the role of public policies in alleviating distress. His research was awarded the TIAA Paul A. Samuelson Award, the AQR Top Finance Graduate Award, and the David A. Wells Prize for best economics dissertation at Harvard. It has been covered by media outlets such as the *New York Times*, the *Wall Street Journal*, the *Washington Post*, Bloomberg, and NPR. He earned a Ph.D. in economics from Harvard University, an M.Sc. in economics from the London School of Economics, and a B.A. in economics and in ethics, politics, and economics *summa cum laude* from Yale College. From 2009 to 2011, he worked as a senior policy advisor at the White House National Economic Council focusing on housing and financial markets. He joined the Chicago Booth faculty in 2017.

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Claudia Persico is an applied policy scholar whose research focuses on environmental policy, inequality, health, and education policy using causal inference methods. Persico is also a faculty research fellow at the National Bureau of Economic Research (NBER), an IZA Institute of Labor Economics Research Affiliate, and a Research Affiliate with the Institute for Research on Poverty at the University of Wisconsin-Madison and the Institute for Policy Research at Northwestern University. Her research has recently been featured in the *Quarterly Journal of Economics*, the *Journal of Labor Economics*, and the *Journal of Human Resources*. Her current work examines the social and biological mechanisms underlying the relationships between poverty, the environment, and children's cognitive development and health. In particular, much of her current research focuses on how early exposure to environmental pollution can cause inequality by affecting child and adult health, development, behavior, and academic achievement. She has also studied how school funding impacts long-term outcomes, how school segregation affects racial disproportionalities

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Jonathan Pingle is a managing director and the chief U.S. economist at UBS. Pingle joined UBS in 2021 after more than five years at BlackRock where he was the Head of Economics for Global Fixed Income, and prior to that spent nine years at Brevan Howard Asset Management where he was a Senior Economist. Pingle began his career in the Macroeconomic Analysis Section of the Board of Governors of the Federal Reserve System, working in the team that produced the staff forecasts and regularly briefed the Board. His published research includes work on labor markets, aggregate labor supply, and the economics of aging. Pingle holds a bachelor's degree from the University of Connecticut, a master's degree from the University of Chicago, and a Ph.D. in economics from the University of North Carolina at Chapel Hill.

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Louise Sheiner is the Robert S. Kerr Senior Fellow in Economic Studies and policy director for the Hutchins Center on Fiscal and Monetary Policy. She previously served as a senior economist in the Fiscal Analysis Section for the Research and Statistics Division with the Board of Governors of the Federal Reserve System. In her time at the Fed, she was also appointed deputy assistant secretary for economic policy at the U.S. Department of the Treasury (1996) and served as senior staff economist for the Council of Economic Advisers (1995-96). Before joining the Fed, Sheiner was an economist at the Joint Committee on Taxation. Sheiner pursues research on federal and state and local fiscal policy, productivity measurement, demographic change, health policy, and other fiscal and macroeconomic issues. She received her Ph.D. in economics from Harvard University, as well as an undergraduate degree in biology at Harvard.

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Melvin Stephens Jr. is professor of economics in the Economics Department at the University of Michigan, with a courtesy appointment in the Ford School of Public Policy. He serves as a research affiliate at the Population Studies Center and a faculty associate at the Survey Research Center, both within the Institute for Social Research. Stephens is also a research associate at the National Bureau

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Daniel M. Sullivan is an economist and research lead at the JPMorgan Chase Institute where he leads teams studying student debt, consumer responses to government stimulus, unemployment insurance, and other labor market topics. Prior to the Institute, Daniel was a research fellow at Resources for the Future where he researched household responses to air pollution and environmental regulation. He also maintains an econometrics and data utilities package for Python called Econtools. His primary research interests are in public economics, especially local public finance and the effects of local air pollution. He received his Ph.D. in economics from Harvard University in 2016 and a B.S. in economics and mathematics from Brigham Young University.

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Stacey Tevlin was appointed director of the Division of Research & Statistics at the Federal Reserve Board of Governors in 2019. At the Fed, she has held several positions in R&S leading teams of economists producing the staff forecast of the U.S. economy. She also served as special advisor to former Vice

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Joseph Vavra, Professor of Economics, studies macroeconomics and monetary economics, the influence of housing on the macroeconomy, and the effects of regional business cycles on aggregate activity. His recent research argues that monetary policy actions such as QE1 during the Great Recession amplified inequality and explores the consequences of stimulus policies during the pandemic. Vavra holds multiple degrees (Ph.D., M.Phil., M.A.) all in economics from Yale University and earned a B.A. *magna cum laude* in math, mathematical economic analysis, and statistics from Rice University.

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Susan Wachter is the Sussman Professor of Real Estate and Professor of Real Estate and Finance at The Wharton School of the University of Pennsylvania. From 1998 to 2001, she served as Assistant Secretary for Policy Development and Research, U.S. Department of Housing and Urban Development, the senior urban policy official and principal advisor to the Secretary. During her tenure at HUD, Wachter's office was responsible for the New Markets Tax Credit, the major legislative initiative for urban revitalization, with the goal of attracting private capital into low-income communities. At The Wharton School, she was chairperson of the Real Estate Department and professor of Real Estate and Finance from July 1997 until her appointment to HUD. At Penn, she co-founded and currently is co-director of the Penn Institute for Urban Research. She also founded and currently serves as director of Wharton's Geographical Information Systems Lab. She was the editor of *Real Estate Economics* from 1997 to 1999 and currently serves on the editorial boards of several real estate journals. Wachter is the author of more than 200 scholarly publications and is the 2022 recipient of the John M. Quigley Medal for Advancing Real Estate and Urban Economics from the American Real Estate and Urban Economics Association (AREUEA). Wachter has served on multiple for-profit and not-for-profit boards and on the Affordable Housing Advisory Committee of Fannie Mae and the Office of Financial Research Advisory Committee of the U.S. Treasury and is currently an advisory committee member of the Bureau of Economic Analysis of the Department of Commerce. She frequently comments on national media and testifies to Congress on U.S. housing policy.

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David Wessel is a senior fellow in Economic Studies at Brookings and director of the Hutchins Center on Fiscal and Monetary Policy, the mission of which is to improve the quality of fiscal and monetary policies and public understanding of them. He joined Brookings in December 2013 after 30 years on the staff of the *Wall Street Journal* where, most recently, he was economics editor and wrote the weekly Capital column. David is the author of two New York Times best-sellers: *In Fed We Trust: Ben Bernanke's War on the Great Panic* (2009) and *Red Ink: Inside the High Stakes Politics of the Federal Budget* (2012). His most recent book is *Only the Rich Can Play: How Washington Works in the New Gilded Age* (2021), the story of Opportunity Zones. He has shared two Pulitzer Prizes, one in 1984 for a *Boston Globe* series on the persistence of racism in Boston and the other in 2003 for *Wall Street Journal* stories on corporate scandals. David is a member of the Bureau of Labor Statistics' Data Users Advisory Committee. He also has taught in the Dartmouth Tuck School of Business Global 2030 executive education program and in the journalism program at Princeton University.

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Paul S. Willen is a senior economist and policy advisor in the Federal Reserve Bank of Boston Research Department. His research focuses on household financial management; he recently has spent much of his time studying mortgage markets. His research appears in the *Review of Economics and Statistics*, *Economic Theory*, the *Journal of Finance*, the *Journal of Public Economics*, the *Journal of Urban Economics*, the *NBER Macro Annual*, the *Brookings Papers on Economic Activity*, and elsewhere. Willen's research on the origins of the subprime mortgage crisis has appeared in scholarly journals and has been cited in virtually every major newspaper in the United States. Prior to joining the Boston Fed in 2004, Willen was on the faculty at Princeton University and the University of Chicago. He is a visiting lecturer at Harvard University and has been a visiting member of the faculty at the Massachusetts Institute of Technology. Willen did his undergraduate work at Williams College and earned his Ph.D. from Yale University.

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The COVID-19 pandemic posed an extraordinary threat to lives and livelihoods. In the United States, the pandemic triggered a sharp downturn. Yet, the ensuing economic recovery was faster and stronger than nearly any forecaster anticipated due in part to the swift, aggressive, sustained, and creative response of U.S. fiscal and monetary policy. But when the next recession arrives, it most likely won't be triggered by a pandemic.

Recession Remedies examines and evaluates the breadth of the economic-policy response to COVID-19. Chapters address Unemployment Insurance, Economic Impact Payments, loans and grants to businesses, assistance to renters and mortgage holders, aid to state and local governments, policies that targeted children, Federal Reserve policy, and the use of non-traditional data to monitor the economy and guide policy. These chapters provide evidence and lessons to apply to the next recession.

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